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THE DOUGLAS FIR

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Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay $367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal coöperation with the States, especially in forest fire protection.

State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by coöperation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

AMERICAN FORESTRY

The Magazine of the American Forestry Association

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THE DAY OF NO TIMBER

Is farther away now than the ultra-conservationists ten years ago said it was when they spread an alarm of exhausted supply.

THE theory of exhaustion has been dismissed. Wood is still abundant. It is still and always will be the warm, friendly material that makes four walls a cosy cottage or a magnificent mansion. Our regard for it is inherent. Our children will continue to use it because its adaptability, beauty of finish and sound absorbing qualities give it a home-making charm that no other material possesses.

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American Forestry

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Douglas Fir

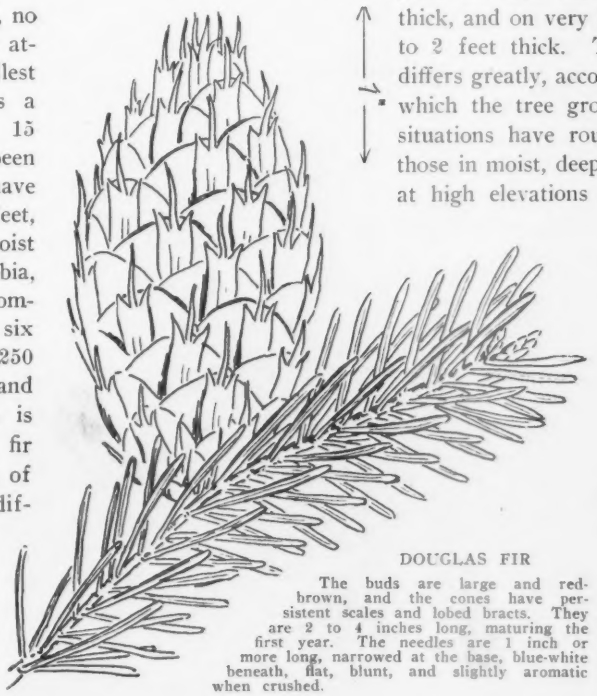
Identification and Characteristics

By Samuel B. Detwiler

DOUGLAS fir is a true westerner. It is widely traveled, adapts itself easily to varying situations, thrives under favorable conditions, and is brave and persevering in the face of adverse circumstances. It grows throughout the Pacific Coast region and the Rocky Mountains from British Columbia to northwestern Texas, Mexico and the mountains of California. Its range extends over 2,000 miles from north to south and nearly 1,000 miles from east to west. No other important American timber tree is more widely distributed or grows under a greater range of climatic conditions.

Lumbermen and foresters know this tree under its accepted name of Douglas fir, but it is also well known as Red fir, Yellow pine, Oregon pine and Douglas spruce. Superficially, Douglas fir resembles hemlocks, spruces and balsam firs, but it has no near relationship with the pines, although the wood is slightly resinous and pine-like.

Except the giant redwood, no other tree of our continent attains larger size. The tallest Douglas fir on record has a height of 380 feet. Trees 15 feet in diameter have been found, and single trees have been cut that scaled 60,000 feet, board measure. In the moist climate of British Columbia, Washington and Oregon, it commonly grows from four to six feet in diameter and 180 to 250 feet in height. The lowland form of the Pacific Coast is much unlike the Douglas fir found in the high altitudes of the Rocky Mountains. The difference is so marked that some authorities consider that the two forms are separate species. In the drier mountainous regions it is much smaller, usually not to exceed 1½ to 2½ feet in diameter, and 75 to 100 feet in height. In very exposed situations it becomes stunted and dwarfed, sometimes growing only a few feet high.



DOUGLAS FIR

The buds are large and red-brown, and the cones have persistent scales and lobed bracts. They are 2 to 4 inches long, maturing the first year. The needles are 1 inch or more long, narrowed at the base, blue-white beneath, flat, blunt, and slightly aromatic when crushed.

In early life the lower branches usually droop with a slight curve, while the middle and upper ones have an upward trend. This gives the tree a steeple-like effect. In dense forests, the branches are killed on the lower half or two thirds of the trunk. In old age, the Pacific Coast trees are clear of branches for 80 to 100 feet; the trunks taper but little and the tops are rounded or flattened.

The bark of young trees is thin, smooth, ash-brown and with resin blisters, like true firs. On old trees the bark is dark brown outside and clear red brown when cut into. It is deeply furrowed and has heavy irregular ridges connected at intervals by narrow cross ridges. Near the base the bark may be 5 to 10 inches thick, and on very large old trees it may be 1½ to 2 feet thick. The appearance of the bark differs greatly, according to the conditions under which the tree grows. Trees in dry, exposed situations have rougher and harder bark than those in moist, deep forests. In dry atmosphere at high elevations the bark is often soft and corky and of a gray-brown color.

The leaves are soft and flat, one to one and one-half inches long, blunt at the point. They have tiny but distinct stems which permit them to arrange themselves, feather-like, on opposite sides of the branches, but in reality they are spaced all the way around the branch, and the successive leaves form spirals. In color the mature foliage is usually a deep yellowish green, al-

DOUGLAS FIR BARK

On old trees the bark is dark brown outside and clear red-brown when cut into. It is deeply furrowed, and has heavy, irregular ridges. Near the base the bark may be from five to ten inches thick, and on very old trees as much as two feet thick.

though in the Rocky Mountains it may assume a blue-green shade. The leaves remain on the trees from 5 to 8 years, and sometimes 11 years, before they fall.

It makes the finest appearance in the months of June and July. The rich brown buds with which its sprays are tipped swell and break about this time, revealing the young leaves, which at first are bright yellow, making the tree appear as if covered with gay blossoms; while the pendulus bracted cones with their shell-like scales are a constant adornment.

The young trees are mostly gathered into beautiful family groups, each sapling exquisitely symmetrical. The primary branches are whorled regularly around an axis, generally in fives, while each is draped with long, feathery sprays, that descend in curves as free and as finely drawn as those of falling water.

The buds of Doulas fir enable the observer to tell this tree from all other evergreens except the closely related big-cone spruce. They are sharp pointed and conical, with bright red-brown scales. The buds at the ends of the twigs are about one-fourth inch long and twice the size of the buds on the sides of the branches.

The flowers are small, scaly bodies, appearing in the early spring. The orange-red pollen-producing flowers are scattered along the branches at the bases of the leaves. The seed-producing flowers are reddish or rose-colored, growing near the tips of the twigs. Usually they are located in another part of the tree from the pollen-producing flowers. The latter fall from the tree after the pollen is shed. The seed-producing flowers develop into cones that droop gracefully from the branches. The cones vary from one and a half to four and a half inches in length and are composed of interlapping scales. Each of the six or seven central scales bears two small, triangular winged seeds.

Douglas fir is easily distinguished from all other native cone-bearing trees by the feathered appearance of the cones. This peculiar feature is due to flexible, trident-shaped bracts that extend conspicuously about one-half inch beyond the cone scales. The nearest relative of Douglas fir, the big-cone spruce, has larger cones and the bracts do not extend much beyond the scales. The Pacific Coast form of Douglas fir has a longer and more cylindrical cone than the mountain form, and the feathering is less noticeable because the bracts lie close to the scales instead of protruding at a wide angle, as in the mountain form.

Nature has provided Douglas fir with highly effective methods for scattering its seeds; as a result, it takes possession of burned forest areas very rapidly. The bare mineral soil which is exposed after a fire has swept through the forest is especially favorable for the germination of the seeds. Trees may begin to bear cones as early as twelve years of age; very old trees produce little or no seed. Vigorous trees produce a fair crop of cones every year and very large crops every three to five years.

The color of the wood is light red or yellow, with a narrow band of nearly white sapwood. The wood is heavy, hard and strong, but usually is coarse grained and difficult to work. Each year's growth is plainly marked by a band of light-colored wood formed early in the season which grades into a band of dark-colored, flinty summer wood. Owing to the prominence of the rings, the lumber occasionally may be mistaken for yellow pine or larch.

The heartwood of Douglas fir is durable in contact with the soil. A fallen fir log in a Washington forest was found to be perfectly sound two inches beneath the surface, although a cedar tree 78 years old was growing on it. It is one of the woods extensively used for creosoting for structural and bridge timbers and railroad ties.

Douglas fir grows under many different conditions of soil and climate. For rapid growth it requires deep, well-drained loam soils and abundant rainfall. It grows from sea level where the rainfall exceeds 100 inches to nearly 11,000 feet altitude and 15 inches of precipitation, in the southern part of its range. It develops a wide-spreading and deep root system in deep loam soils. On poorly drained land and shallow soils the root system is flat and spreading, while on rocky or sandy soils more or less of a tap-root is developed.

The scientific name for Douglas fir means "false hemlock." It does not partake closely of the character of the hemlocks, which are noted as being our most shade-enduring species; Douglas fir will live under moderate shade, but will not thrive in dense shade. Its requirements in this respect vary with soil and moisture condi-

tions. In western Washington, Oregon and British Columbia large areas of young growth, composed almost entirely of Douglas fir, are common. The peculiar ability of this tree to reproduce itself is illustrated by counts of over 30,000 eleven-year-old trees, about three feet high, on a single acre. In the virgin forest where Douglas fir is the principal species, the acre yield usually runs from 2,000 to 8,000 feet B. M. in the mountains, and from 35,000 to 60,000 board feet near the Coast. Occasionally acres are found in the Coast region, where the yield is over 100,000 feet B. M., one instance being recorded of 500,000 feet B. M. per acre. The time required to grow trees in a forest of this character has been conservatively estimated at upward of 400 years; more than 700 annual rings have been counted on a single Douglas fir stump.

Forest fires cause the greatest damage to Douglas fir forests; this damages comprises not only the direct destruction of the trees but also indirect damage by causing unfavorable soil conditions and burning fire scars at the bases of the trees through which insects and fungi may enter. The principal insect enemy of the tree is a beetle which bores between the bark and the wood, frequently causing the death of the tree.

Douglas fir derives its name from David Douglas, a Scotch botanist who obtained seed in the State of Washington and planted it in England in 1827. It grows more rapidly than any of the native evergreen trees of Europe and has been widely used in European plantations. The Pacific Coast form is principally planted in Europe; in the Eastern United States the Pacific Coast form does not thrive, and the Rocky Mountain form should be planted. Douglas fir is a valuable ornamental tree of graceful proportions, good color, rapid growth, and exceptional hardiness. It has been planted to a considerable extent in the Northern Prairie regions for wind breaks and shelter belts. Because of its exceptional commercial value and the ease with which it is managed in forest plantations, Douglas fir is likely to become one of our most important evergreen trees. More than one-half of the timber at present standing in western Washington and Oregon and southwestern British Columbia is Douglas fir. Lumber of this species can be transported cheaply through the Panama Canal to the markets of the Atlantic Coast, and the public is already becoming acquainted with this interesting wood.

AREA OF DOUGLAS FIR

Commercial Uses of Douglas Fir

By J. S. Williams

SEVERAL hundred years before Columbus discovered that there was another world, there fell on the warm, moist, western slope of the Cascade Mountain Range in Oregon and Washington seeds of the Douglas fir. These seeds, finding conditions favorable to their growth, germinated and grew, and have continued growing even to the present day, though now their height is measured in hundreds of feet and their diameters twelve, thirteen, fourteen, and some few of even a greater number of feet. While the average tree in mature stands of Douglas fir will not, of course, average these great diameters, yet trees of this size are not at all uncommon in that region.

The first explorers to the northwest region, upon returning to their native habitations, told principally of the thick stands of timber and the great size of the individual trees that they found there. Several generations later, as settlements grew up in that region and as ships seeking their cargoes drifted to those parts, they carried away with them long, straight spars to be used for masts in the construction of other ships. And so it has happened that Douglas fir has been best known to the world because of its gigantic size. But it is quite fitting that its uses and qualities be told, as well as its romance.

ROTARY CUT DOUGLAS FIR VENEER

TRADE NAMES

In the lumber markets of the world Douglas fir is known also, to a greater or lesser degree, by the following trade names: Oregon

Copyright photograph by Darius Kinsey.

A VIEW IN THE WOODS SHOWING THE LOADING OF A DOUGLAS FIR LOG ON CARS

The mammoth size of Douglas fir necessitates powerful machinery for harvesting the logs. This exceptional picture shows the "yarding in" of the log from the woods, the loading of the logs on railway cars, and a virgin stand of Douglas fir in the background. The logs are drawn in a distance of approximately 1,000 feet from either side of the track.

pine, red fir, yellow fir, Puget Sound pine, and Douglas spruce. In foreign countries, especially those of the Orient and the United Kingdom, it is best known, perhaps, as Oregon pine. The names red fir and yellow fir originate from the characteristic color of the wood when grown under certain conditions of soil and in certain localities. There are other trade names of very sectional use, but these are little used today. Again, this species has been confused as to name with certain inferior species, but today the name in most common use and its proper name is Douglas fir.

SUPPLY AND CUT

The rather general belief that the timber supply of this country will soon be exhausted is seen to be of poor foundation when one is apprised of the fact that at the present rate of cutting there is enough of this wood in the Pacific Northwest to last approximately another 150 years, and as Douglas fir can be grown to commercial size in from fifty to seventy-five years under the climatic and soil conditions there found, it is quite manifest that the ninth and tenth generations from now will still be enjoying a bounteous supply of this excellent wood.

The normal, annual cut of Douglas fir is approximately five and one-half billion. This production is represented principally by Oregon and Washington mills, though California, Idaho, and Montana collectively contribute two hundred million feet of this total. British Columbia, too, is a very large producer of Douglas fir, and has extensive arears of this timber; but its production is not considered in the foregoing figures.

GROWTH AND SIZE

Douglas fir reaches its maximum growth and size and is found in heaviest stands on the western slope of the Cascade Mountain Range in Oregon, Washington, and British Columbia, where the mild winters and generous rainfall contribute ideal growing conditions.

It is found generally admixed with western hemlock, western red cedar, and in some localities with western spruce. Rarely is it found in pure stands, and when so found the areas are quite limited.

Some species, as an example, redwood, are characterized by the immense size of individual trees, but Douglas fir is marked also because of the large average size of the trees and the density of tree growth per unit area. Ofttimes one can find the trees growing so closely together that a considerable distance can be traversed through which one is able to have his hand placed on a tree for every step of the way.

THE TWO VETERANS

The butt end of a Douglas fir log some thirteen feet in diameter and one of the old lumbermen who has spent most of his life in the Pacific Coast lumber industry.

PROPERTIES OF THE WOOD

United States Forest Service Bulletin 108 shows that Douglas fir is the strongest wood for its weight of any wood found in the United States, and that it ranks near the top in strength value among all woods. This bulletin shows it to have an average breaking strength of 6,605 pounds per square inch in green stringers and 7,142 pounds in air-seasoned ones. Its green weight is 3,300 pounds per 1,000 feet board measure. Its great strength, combined with its lightness, makes it an ideal structural wood. Its practically inexhaustible supply, the decreasing areas of other good structural woods and their comparatively small supply, mean that Douglas fir will, before many decades, become the most common and most used of all our American woods.

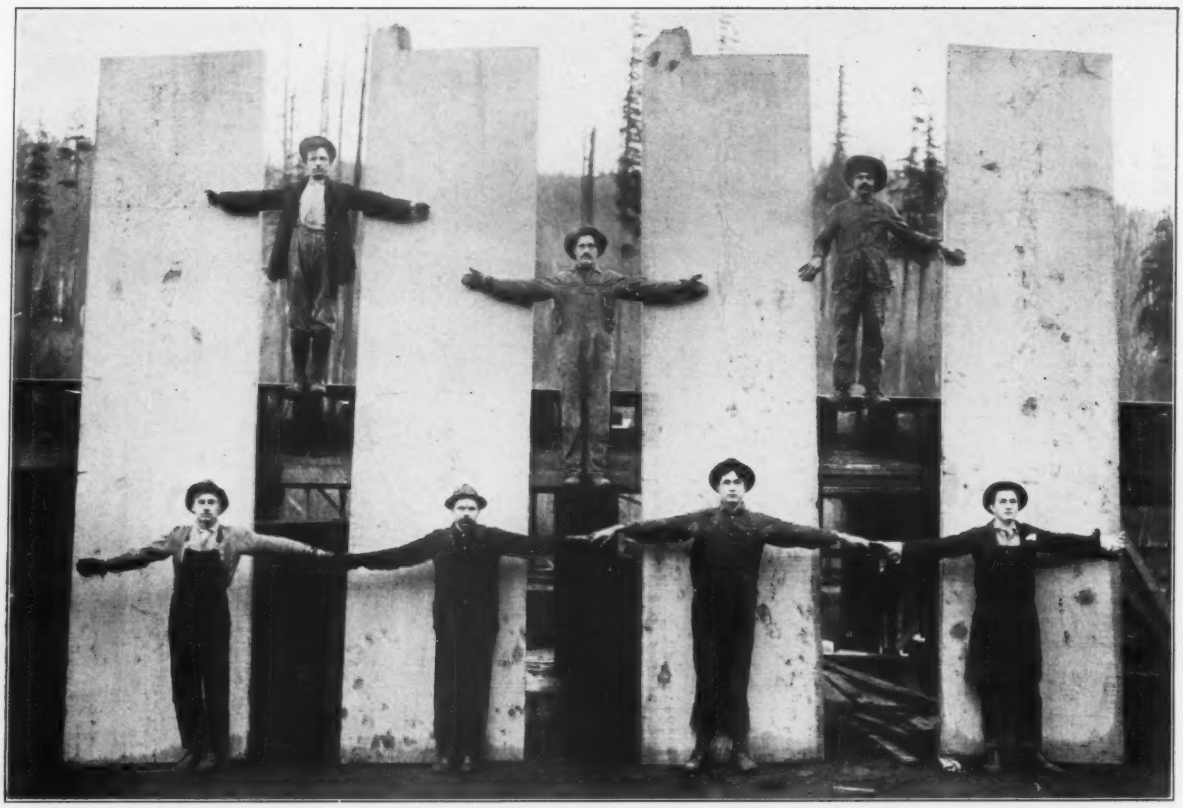
Because of the immense size of the timber, a Douglas fir log will produce a very high percentage of perfect timber, free from knots and other defects common to species of smaller growth.

Douglas fir offers a marked contrast between its spring and summer rings of growth. This characteristic gives the wood an extraordinarily pleasing grain, or figure, when cut at certain angles to the log. The greatly admired beauty of hardwoods, especially the oak in its quartered faces, is obtained by cutting the boards parallel with the radial planes of the log. This is due to exposing the greatest possible area of the medullary rays. Douglas fir, as all conifers, has very small medullary rays, so one must not look to this characteristic for its beauty. To obtain the most pleasing grain in this wood, the rings of growth must be cut across at a very small angle. This is done by rotating the log after a softening bath in steam against a sharp knife, and a thin section of the wood is laid out on a table in one immense sheet. In rotating the log against the knife the rings of growth are cut across nearly parallel, thus exposing large, irregular areas of the hard and soft, or dark and light, rings, creating myriads of irregular designs. One with a fair imagination can make out contours of almost any object he might desire.

A LARGE AIR-DRYING YARD OF DOUGLAS FIR

Air drying reduces the amount of moisture and simultaneously increases the strength. The large mill in the background cuts over 400,000 feet of lumber every working day. This particular sawmill is said to be "the last word" in efficiency.

In point of durability Douglas fir ranks well, and when used in construction intelligently, enabling sufficient and proper ventilation, will last several generations.



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THIS SPEAKS FOR ITSELF

This picture shows the great width of clear lumber that can be obtained from Douglas fir timber. Douglas fir produces a very high percentage of absolutely clear lumber.

Douglas fir is one of the very few woods which is well adapted to construction throughout, either in the home or commercial structure. For use as sub-sills, joists, studding, and rafters it has strength and durability; for use as siding it has beauty and durability and holds paint well; as a flooring material it offers great resistance to wear, and for the interior finish of the home, the paneling, baseboards, stairwork, doors, sash, moldings, or other finish requirements its beauty adapts it admirably.

But while filling well the needs of a home-building wood, it is none the less a factory, store, bridge, and general structure wood. Its strength, lightness, and durability are the desired characteristics for these purposes. Railroads are large purchasers of Douglas fir for car construction, railroad ties, trestle work, piling, poles, and miscellaneous work. In 1909, when approximately one hundred and twenty-five million ties were purchased, Douglas fir contributed over nine million of them, and would furnish many more but for the long haul to the principal tie markets. Southern pine furnished twenty-one million and the oaks fifty-seven million.

The same year twenty-five thousand poles were cut from Douglas fir. The cedars, however, are preferred for this use because of their extreme durability.

No data are available on the amount of piling driven annually, but Douglas fir is exceeded only by the Southern pines as a piling wood. The four requisites of a good piling are straightness, strength, length, and durability. Douglas fir is nearly always "pencil" straight, amply strong, clear length up to one hundred and fifty feet, if desired, and is the equal in durability of other woods used for this purpose. Creosoting greatly lengthens the life of piling, and a marked increase in the number of creosoted Douglas fir piles is noted annually. The creosote acts as a poison to the great enemy of piling, the toredo, and, in addition, preserves the wood.

WOOD BLOCK PAVEMENTS

In trend with the modern tendency toward increased efficiency may well be mentioned the use of creosoted wood blocks in pavement construction as a distinct improvement over the commonly used materials. Silence to traffic, longer life, more even wearing surface, better service, small maintenance cost, ease of repair, quickly laid, and sanitary are terms which describe the Douglas fir wood block pavement. Several examinations have been made recently of this type of paving where the blocks had been down for from eight to fifteen years, and none of these showed more than one-quarter inch wear in all of that time. And they bid fair to last an indefinitely longer period under the same satisfactory

conditions of service. Wood block pavements have reduced the noise of traffic so that property values and rents of buildings abutting streets so paved have increased materially.

Fully fifty per cent of the cross arms used by telephone and telegraph companies are of Douglas fir. In 1909 one and three-quarter million cross arms were manufactured from Douglas fir. These were sold for an average f. o. b. price of 38 cents each, which was slightly above the price paid for other competing species. Lightness and strength are the principal requisites in cross arms.

Douglas fir is now used extensively for boxes and heavier crating purposes, especially where greater strength is required in a box than the softer woods most used possess. Douglas fir veneers are now used in fruit and vegetable basket manufacture.

Lath are manufactured from this wood

Copyright photograph by Darius Kinsey.

FELLING A DOUGLAS FIR TREE

Showing the "undercut" preliminary to felling a Douglas fir giant 17 feet in diameter. This tree contains sufficient lumber to build four modern cottages complete. Trees of this species have been found of even larger diameters.

to the extent of over one-half billion pieces per year, and their value for this purpose runs close to the million-dollar mark.

A field which is fast developing is in the use of wood stave pipe, stave tanks, and stave silos. The requirements of a wood stave for these purposes are strength, close grain (water-tight), durability, and absence of defects. Douglas fir is a favorite wood for this purpose, as attested by the large amount of lumber cut annually into staves for such construction.

Continuous stave pipes, bound together by iron bands, are well adapted for purposes where the internal pressure is quite high, such as found when water is transported under a high head. This style of pipe is extensively used in conducting water for irrigation purposes, hydro-electric projects, and for city water supplies. The Pueblo Rocky Ford Company, in Colorado, carries water four miles from a dam to the head of their irrigation canal by a continuous Douglas fir stave pipe eighty-four inches in diameter. Seattle brings its water supply a distance of forty miles from the Cedar River through two lines of Douglas fir stave pipe. The largest

THE LARGEST WOOD PIPE IN THE WORLD

This pipe is 13 feet 6 inches in diameter. Built of Douglas fir staves. Wood stave pipe has a low initial cost, exceedingly low maintenance cost, a low factor of friction, and will withstand very heavy pressures. As its merits become more widely known its use will no doubt be largely extended.

DOUGLAS FIR FOR INTERIOR DECORATION

This is the reception room of the Pan American Building at Washington, D. C. It is finished in Douglas fir, given by the Oregon and Washington Douglas Fir Dealers' Association. The room was one of the show places in the Pan American Building, which attracted much attention from the delegates during the recent Pan American Scientific Congress.

pipe of wood in the world was made in the same manner to conduct water for hydroelectric purposes a distance of one mile. This pipe is one hundred and sixty-two inches inside diameter, and was erected in the State of Washington not far from Portland, Oregon.

Tanks and silos require big amounts of this wood annually, and almost all mills cutting Douglas fir carry stock known as "silo stock." Douglas fir is peculiarly fitted to use for stave tanks for holding acids. Concerns which have to use a considerable amount of acids in their manufactories prefer Douglas fir for these tanks because of their extreme resistance to oxidation by acids. The wood stave silo has proven to be quite superior, due to its ease of construction, its strength and durability, and low initial cost. It is estimated that a wood stave silo is from twenty to sixty per cent cheaper than silos made from substitute materials, such as cement, brick, tile, etc. The wooden construction can be done by unskilled workmen, saving quite an item in construction expense. Moreover, the wood keeps the temperature of the ensilage more nearly uniform than materials which are good conductors of heat.

FURNITURE

Although being a little too soft for the construction of the finest furniture, yet the furniture business every year consumes several million feet in the manufacture of moderate-priced furniture. For work tables, shelving, counters, cabinets, cupboards, and like equipment it answers well the requirements, and, in addition to its initial cost, is so much below that of hardwoods that it finds quite general use for such purposes.

MISCELLANEOUS USES

In the construction of boats, such as sailing vessels, the smaller-sized steamers, auxiliary-power schooners, and the smaller craft manufactured on the Pacific Coast, Douglas fir is used almost exclusively. It is especially desirable for such construction, because the long, clear timbers required are so easily obtainable.

Many novelties and by-products of the general lumber manufacture are now made from Douglas fir. Since the war makes German toys no longer available, there has been a marked increase in the number of toys manufactured from the western woods, and an interesting feature of this change in source of supply is the change in the character of the toys. The

DOOR OF DOUGLAS FIR

The beauty of the finish makes this wood particularly desirable for interiors and its use for this purpose is steadily increasing.

SOME BOARDS OF DOUGLAS FIR

These are not of an exceptional size, but are samples of the daily run at many of the big mills on the Pacific Coast.

toys which find most ready sale now are those of an educative nature, such as building blocks, toy houses of wood, and other objects which the child can build for himself.

The innumerable uses to which wood is put, which are not classified according to special uses, but which, in the aggregate, require millions of feet annually, are well represented in species by Douglas fir.

GRADES AND PRICES

On December 1, 1915, the following prices were those prevailing for the general classes of lumber manufactured from Douglas fir. The prices listed are f. o. b. the car at the points of manufacture:

Class and Grade.	*Size.*	*Price per M. ft. B.M.*
Vertical Flooring, No. 1 Clear.....	1 x 3	$26.50
No. 1 Clear.....	1 x 4	22.50
No. 2 Clear.....	1 x 3	21.50
No. 2 Clear.....	1 x 4	19.50
Flat grain Flooring, No. 2 Clear and better	1 x 4	13.50
	1 x 6	19.50
Finish, No. 2 Clear and better.....	1 x 6, 6′–16′	23.50
	1 x 12, 6′–16′	26.50
Ceiling, No. 2 Clear and better.....	⅝ x 4, 10′–16′	13.50
Drop Siding, No. 2 Clear and better...	1 x 6	18.00
Silo Staves, No. 2 Clear and better.....	2 x 6, 8′–22′	15.00
Common boards and shiplap, common	1 x 8, 6′–20′	9.50
Dimension, Common	2 x 3, 2 x 4, 12–14′	8.00
	2 x 12, 12–14′	8.50

While Douglas Fir today ranks second in the amount of timber cut annually, being outranked by a combination of the three Southern Pines, longleaf, shortleaf and loblolly, the almost universal use to which this wood can be put, the practically inexhaustible supply of this timber, the comparatively rapid decrease in the stands of other species, the Panama Canal making possible delivery in eastern United States at reasonable rates, and a better knowledge of the merits of the wood by people generally, undoubtedly will in the future give Douglas fir the just title of "The All-Utility Wood."

IN A WASHINGTON FOREST

By Donald A. Fraser

Huge pillar-firs rise round me, straight, serene—
  Brown pillars, mossed and flecked with lichens gray—
  So thick they throng their shadows dim the day
That filters through the roof of somber green
In golden shafts, to shatter on the sheen
  Of viney-maple leaves that spread their spray,
  So fairy-like, so flutteringly gay
Among the grim dark trunks they stand between.
The yielding floor of twigs and matted spines,
  Dead memories of many a sunny ray—
Is carpeted with ferns and trailing vines,
  So soft, my foot-fall's silent as I stray.
Here Peace and Silence in their temple dwell,
And bows my heart beneath their magic spell.

Photograph by Mark Daniels.

THE GROVE OF CYPRESS TREES FIRST SEEN ALONG THE FAMOUS DRIVE

The Seventeen-Mile Drive is a road, the smoothness of which makes a drive over it seem but a continuation of the ride in the luxurious Southern Pacific coach which brings the tourist to this land of enchantment. It is indeed a blessing that the steel rails stop before they penetrate this forest of cypress.

The Tree of Legend and Romance

By Mark Daniels

Former Superintendent of National Parks

THERE is a lone tree in Lombardy that accomplished what a million men suffered and slaved to do. It stood in the path of the great Simplon road, and at the sight of its stately grace Napoleon turned the road from a straight line, that its beauty might remain man's heritage. It is the cypress of Somma, and stands as a monument to the greatness of one man and a lesson to those who would sacrifice beauty to the god of gain. That Napoleons are scarce we know, but are there so few who have not even enough of his vision to see and appreciate the glory of a magnificent forest or the eternal miracle of a waterfall that they will continue to squander these birthrights by indiscriminately hewing down the forests and damming up the streams?

Perhaps this cypress of Somma, if it has not been shot down by another of man's engines of destruction, still stands as the first example of the spirit of conservation. And saved for its beauty alone! Think of it! I hear the groans of anguish as some millionaire lumberman of Minnesota estimates the amount of board feet of precious lumber that is contained in its 120 feet of towering trunk. Napoleon might have built a nearby bridge with it, thereby saving the cost of hauling; or he might have built a fire in which to heat iron for axes with which to chop down more trees! But he did not, and that fact will redound ever to his credit and to the shame of those who are so ruthlessly stripping our land of its forest cover.

There stands not one cypress, but a grove of them, of surpassing beauty, on our western coast. True, they are not of that tall, stately variety, with formal, architectural lines; they are, on the contrary, the exact or complete reverse, for they are gnarled and twisted; but they are beautiful in their setting as anything that the eyes of man may rest upon. There is but a comparatively small area where they still grow, and they are as distinct among the other conifers of their region as are the Sequoia Gigantea

Photograph by Mark Daniels.

A VISTA ON LOBOS POINT

At every turn of the winding trail a new vista, startling in its exotic character, bewilders the observer, until the sense of location and direction is all but lost. Climbing amongst the trees and rocks on this rugged point is as hazardous as threading the twisting lanes of the old-fashioned maze.

amongst the conifers of the Sierra Nevada. In fact, in many respects they remind one of the "big trees," as they are called; for they have a most distinct individuality which makes them stand out alone. They are to be found only in a certain locality, and their age is much disputed. I have heard the last-named estimated to be from 100 to 7,000 years, and there seems to be no reconciling the various contestants. However, the question of whether they have seen one or twenty generations of time would seem to be of small moment, in the light of the fact that they are struggling through the last few years of one generation of American tourists. But they seem to stand the storm of "Oh's" and "Ah's" with that same fortitude with which they resist the gales and blasts of that beloved seacoast on the very edge of which they spread their spiraled roots. Growing down at the actual verge of the sea, with bare branches stretched out like arms toward the land of the setting sun, the question of whether they are the vanguard of an ancient western growth or the stragglers of the great eastern forests that were cut off by the Pacific is almost always the first subject of conjecture on the part of the tourist.

About 125 miles down the coast from San Francisco lies the Bay of Monterey, at the southern extremity of which the first cypress trees are to be found. These trees possess more the character of the cedar of Lebanon than they do of any variety of cypress, and are known to those who burden their minds with etymological detail as the *cupressus marcrocarpa.* From this point, which is known as the Del Monte Peninsula, and which forms the southern shores of this wonderful sapphire bay, picturesque groves and occasional isolated specimens are dotted along the coast for some twenty-odd miles to Lobos Point. Here, again, the old adage, "It never rains but it pours," is borne out by the riot of exquisite beauty which confronts the observer on every side. Nature seems to have concentrated on this locality in the development of extremes of picturesqueness and intensity of color. The shore line is broken and jagged, with here and there a stretch of ivory-colored sand beach, terminated and broken by precipitous cliffs, against which the indigo sea hurls its pearls and sheets of water that are a pale jade green against the lemon-colored horizon and the setting sun. A motor trip along the coast line gives one the effect of a kaleidescopic change of coloring, the rapid succession of which should vary with the speed

Photograph by Mark Daniels.

THE VANGUARD OF THE FOREST—A STUDY IN THE HARMONY OF HORIZONTAL LINES

The branches beneath the tops of evergreen are frequently horizontal and almost parallel to the gracefully curved or sloping tops. With the sparkle of the reflected sun and the gold of the horizon line, these branches and vivid green tops form a composition in the harmony of attitudes and a study in purples, greens and golds.

Photograph by Mark Daniels. THE BONES OF HIS ANCESTORS?

These are some of those fallen monarchs whose age is so much disputed. They are bent and twisted beyond anything that may be seen in the standing trees. This rugged tangle of bonelike branches lies beside the drive and seems to cry out for burial.

of the motor were it not for the unholy combination of the modern six-cylinder machine with the freedom granted the tourist by the owners of the property. As it is, however, conditions would appear to be reversed; for, with the average driver, the speed along these wonderful drives is such that the constant prayer of the tourist is that some accident may happen which will allow him sufficient time to fix upon his retina one permanent picture of the exquisite color harmonies of the sapphire bay, the ivory-colored beach line, the silver-gray trunks of the trees, and the deep blue and bright yellow-green of their tops.

Not only is the district one of exquisite beauty of landscape, but it is pregnant with romance and historical interest. On December 10, 1602, almost twenty years before the Pilgrim Fathers landed at Plymouth Rock, Don Sebastian Visciano landed on the peninsula and took possession of the country in the name of the King of Spain. Many romantic changes took place in the administration of the district until about 1770, when Monterey was selected as the capital of the State of California and Don Gaspar de Portola appointed the first governor. The monuments to this famous character, whose name is interwoven with the history of the State of California, are almost as plentiful in number as are the elms in the State of Massachusetts under which George Washington first took command of the Army of the Potomac. More substantial and authenticated, however, are the monuments that were left to the memory of Father Junipero Serra, in the form of missions which he erected throughout the State of California and in which he endeavored to civilize the savage tribes. In 1771 this noted priest built the Mission del Rio Carmelo, which still stands as one of the points of interest in this historical district. The death of Father Serra, in 1784, at this mission, where he was buried, marked the beginning of the history of California as we know it.

In 1846 Commodore Sloat landed with 250 men and raised the flag of the United States over the custom-house. The old custom-house still stands, as do the first brick house, first lumber house, and the first theater in California, and within a short walk of the most beautiful bit of coast line and the most picturesque grove of trees that are to be found on this continent. Whether it was the beauty and charm of this place and its romantic history, or whether it was a clairvoyant power that gave him knowledge of future hordes of tourists who might wish to see one of his homes, is not known; but there is, nevertheless, one of the homes in which Robert Louis Stevenson dwelt in the old historic town of Monterey.

There has been a great deal of speculation as to the origin of these trees which take such strange and weird shapes in their struggle for existance against the coastal storms. Their trunks become gnarled and twisted and take on the hue of the surrounding rocks. The dead leaves and branches that lie in a clutter upon the ground

beneath their spreading branches remind one of nothing more than the bones of some prehistoric monster. They are unusually tough and hard, and appear to have been bleached by centuries of weather. The under portions of the live branches are a russet gold in color, and give one the impression of having rusted through the action of the sea's mists. Their twisted branches are silver-gray and bare, and become a tangled mass at the top, the under side of which is black and moss-covered, bringing

Photograph by Mark Daniels.

A GNARLED AND TWISTED PATRIARCH OF THE CYPRESS GROVE

Strangely enough many of the branches of the more wind-swept trees grow straight out in the direction of the prevailing winds. They are bare and as stiff as steel springs, thrusting their sharp points in the teeth of the gale as if to hurl defiance at the elements.

into vivid contrast the brilliant green of the upper surface of the top. It would appear to be a simple matter to count the rings on one of the fallen trees and thereby determine the age, even though these rings are so close and fine as to make the task an extremely difficult one. This has been done in one instance, and the age of the tree before it fell was ascertained to have been 221 years. The disputed question is just how long the dead tree had been down. Some contend that in a few centuries there will be nothing left of the wood, while others vociferously proclaim their firm belief that the tree was deader than Ptolemy's mummy long before the latter lost its hair.

To substantiate the contention that the dead-and-down trees are very aged, it has been pointed out that cypress is the most lasting of all wood. The ancients engraved their laws upon cypress, which, coupled with the possibility of their having used the same material in the manufacture of clubs, might explain why these laws and the order in which they were drawn to enforce remained intact for so long a time. A statue of Jupiter was carved in cypress and stood without decay for 600 years, which is considerably longer, and is still in a better condition of preservation than the memory of him whose image it is. So there is considerable foundation for the contention that the great age of these dead trees cannot be disproved through the theory that they would have decayed and disintegrated in the length of time they are

Photograph by Mark Daniels.

NEAREST APPROACH TO SLENDER GRACE THAT THESE HARDY TREES ATTAIN

Most of the trees are gnarled and twisted and bent into grotesque shapes. The coastal winds and the spray of the sea bend their tough branches and stain their twigs and foliage with russet gold and purple hues.

supposed to have been down. At a recent visit to this country Lord Balfour, of England, who has given considerable study to cedars and cypress trees, expressed his conviction that one of the dead trees was of the family of the cedar of Lebanon, from which source immediately sprung the belief in some fertile western minds that these trees are the sires of the cedars of Lebanon to be found in the Holy Land. Whether such is the case or not, it should be, in my opinion, a matter of pride to any

self-respecting tree to feel that its ancestry was domiciled on the shores of this glorious bay, and that it had been sired by the most picturesque tree of a continent.

From the hotel at Del Monte a wonderful drive, known as the Seventeen-Mile Drive, follows the coast line past the historic old buildings of Monterey, skirting a mission wall (which should be a standard for modern architects to strive toward) and along the sandy beach past homes of innumerable sea fowl, and plunges into a forest of pines that forms the background to the first grove of cypress trees. From there the road winds in and out amongst the spectral trunks, giving a glimpse here and there of the blue horizon and jagged points of promontories, burying itself now and then in the dark and gloomy shade where the growth is dense. About four miles beyond the first grove of cypress trees is the famous

By C. K. Bonestell, Jr.

LITHOGRAPH SKETCH OF OLD CYPRESS

The individuality and character of these trees is such as to defy the art of the camera. Photographers are plentiful in the vicinity, but their work never seems to carry with it the atmosphere that surrounds these sturdy trees. Mr. Bonestell has caught something of the spirit of the district in his sketch.

Midway Point, which, until the advent of a fleeting exposition, was the most photographed tourist lure on the Pacific Coast. It comprises a rock promontory that projects out into the sea, with its toes lapped by the gentle waves of the Pacific, whose ardor has been tempered by the reefs and submerged rocks farther out at sea, upon whose treacherous points the coastwise traffic of this district is frequently wrecked. Upon the summit of this point, as if placed there by the playful hand of an imaginative painter, grows a lone cypress tree, the roots of which are almost entirely exposed to the air. The top of this tree, however, is brilliant green, and when silhoutted against the sky of the setting sun is indeed a sight to behold. Farther along the coast the drive widens along the shores of Pebble Beach, past the homes of men whose millions are in the banks and others whose for-

By C. K. Bonestell, Jr.

LITHOGRAPH SKETCH OF ONE OF THE OLDEST STANDING TREES

The ground about this old monarch is scarred with the imprints of easel legs and artists' stools. Hardly a season passes that some artist of international fame does not plant himself before this picturesque tree to engage in another struggle with the reproduction of the illusive tints and shades of its trunk and branches.

tunes are still in their heads, to Arrowhead Point, and beyond to the famous mission that marks the mouth of the Carmel Valley. Beyond the point where the Carmel River empties into the sea is Lobos Point, and the quaintest and most curious cannery on this coast. At the latter-named point of interest they preserve the toothsome abalone, a sea product that is peculiarly indigenous to this locality. Many strange and weird tales are told of the dangers of persuading the tenacious abalone to relinquish his clutch upon the surface of his beloved rock. The inhabitants of the district will tell of this man and that who, actuated by an unconquerable desire to bring away a souvenir, has unwittingly placed his fingers beneath the edge of the abalone shell, when, without warning, the vicious brute clamped suddenly down upon his fingers and imprisoned him, like Prometheus bound to the rock, there to suffer a lingering death by drowning

with the rising tide. To hear these tales, one might reasonably be led to believe that the abalone, though nothing but a group of muscles encased in a shell, was possessed of the agility of the cat rather than the sluggish movement that is typical of his species. I personally have never been able to reconcile my instinctive incredulity to the tales of drowning fishermen imprisoned by the ferocious abalone, knowing, as I do, that the average tourist whose shoes have been wetted by an unexpected wave is prone to describe his experience as a miraculous escape from a tidal wave of the Pacific. The fact remains, however, that should one unwittingly allow his fingers to remain beneath the edge of an abalone shell long enough to allow the tremendous clamping power to crush down upon them, he would undoubtedly be either imprisoned or lose his fingers. The practice amongst the fishermen who supply the cannery is to carry a long steel bar, with which they pry the abalone from the rocks in a manner that is astonishingly prosaic for a creature the permanent abode of which is so beautiful.

The Carmel Bay, in which the abalones are most plentiful, is the little sister of the Monterey Bay, just to the north, and the bits of kelp which dot its surface, combined with the strange exotic character of the trees and promontories that bound it, lend an aspect to the landscape that suggests tropical scenery of the islands that lie beyond the horizon. With a good cigar, and even an indifferent book, one may spend a happy afternoon in the shade of the cypress, and find at each upward glance with the turning of a page an entirely new setting, with a foreign drop upon the ever-changing stage that confronts his western gaze. At his feet is an inlet that begins with purple and ends with gold. Against the sky is silhouetted the squat and sturdy cypress, every line of which expresses tenacity and endurance. As the setting sun passes over the sky, the shadows shift and change, and the setting changes from the Land of Beyond to the Land of Nod with a suddenness that is startling. "The cliffs take on a purple hue, the sea is green and then is blue." Truly, Solomon in all his glory was not arrayed like one of these.

Photograph by Mark Daniels.

A SENTINEL THAT BOWS TO THE WIND AND THE SETTING SUN

Here and there along this portion of the coast an occasional tree stands out and aloof from its fellows with its roots actually lapped by the waves of the sea. They appear like nothing more than sentinels posted at the edge of the sea to warn the forests behind of the fury of the waves.

The chauffeur who one day accompanied me said a visitor exclaimed about the roaring breakers that dashed about the cliffs in a vain effort to wash away the scant soil about a cypress that stood out on a headland like a sentinel, "Isn't it just too cute?" I asked him what had been his reply, and he said he had told her he reckoned it was just as cute as the Battle of Ypres, intimating further that, in his opinion, there were times when one was justified in heaping coals of fire upon another's head, despite any little repugnance for the odor of burning bone. With the booming of the waves in the cannon cave at Lobos Point, where the entrapped surf has no other outlet than to roar over its impotence, reverberating along the coast, it was not difficult to agree with him.

With all the hue and cry for the creation of more national parks, particularly when it is considered that the demand is so frequently strongest where the justification is least, it is strange that this area has not been set aside either as a national or a state park. That it has not is probably due to the fact that the public now enjoy all the freedom of the locality that could reasonably be demanded with the added feature of the certain knowledge that political change may not interrupt the generous administration of the district's affairs.

Public reservations of the character of our national parks are set aside for the purpose of preserving features of unusual beauty and of historic and scientific interest. Here is an area—the only one that I know—which possesses all three of these characteristics to a marked degree. It is the sole abode of a species of wonderful trees; it is a district of fascinating historical interest, into which are crowded more relics of days gone by than any other equal area in the West, and, above all, it is a veritable gem of exquisite and surpassing beauty. Therefore, despite the fact that it is not in the category of national parks, it is deserving of attention as the Cinderella of our national scenic areas that is just coming into her own.

The Bird Department

By A. A. Allen, Ph.D.
Assistant Professor of Ornithology, Cornell University

THE IMPLEMENTS OF BIRDS

PASSING through the halls of any of our large museums and inspecting the cases in which are arranged the mounted birds from all over the world, one is impressed by the great variety of their form and color. Almost every imaginable combination of colors is found represented in the plumage of some bird,

HEAD OF A RED-TAILED HAWK

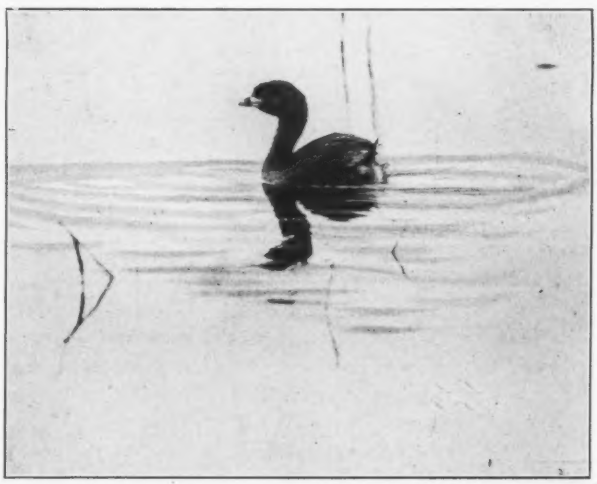
A bill such as this is well adapted to a diet of birds and small mammals, and has been copied by the totally unrelated owls and shrikes.

and the many modifications of size and shape are such as to leave one confused by the heretogenous assemblage. One is almost led to believe that nature has given loose rein to her imagination and allowed her most fantastic dreams to take the form of birds. Yet scientists tell us that there is a reason for everything, that no structure exists unless perfectly adapted to the function which it has to perform. The long legs, slender neck and the great humped bill of the flamingo, we are told, are adapted to its peculiar method of feeding on the minute mollusc life of the tropical mud flats where it lives. The tremendous bills of the South American toucans and African hornbills serve as arms for reaching far out to the smaller branches for the fruits which form the food for these ungainly creatures. But let us consider the commoner of our North American birds with reference to their food and see if there are similar reasons for their variety of form.

The birds of prey, with their long, hooked bills, sharp talons, and powerful wings fitted for the pursuit of birds and small mammals, are doubtless familiar to everyone. So necessary is this type of bill and foot for a carnivorous diet that two totally unrelated groups of birds, the hawks and the owls, having the same feeding habits, have developed such similar structures that for many years they were classified together as forming the Order Raptores, when, as a matter of fact, the owls are much more closely related to the whip-poor-wills.

One group of the common perching birds, the shrikes, which have taken up a carnivorous diet, have likewise developed hawklike bills, although their feet are still of the ordinary perching type. The buzzards, on the other hand, which have degenerated from the carnivorous diet to one of carrion, while retaining the strong hooked bill for rending flesh, have lost the powerful talons and the accompanying strength of limb, so that now they even spring from the ground with difficulty.

But if one examines more closely such a group of birds as the hawks, all having the same type of food, one discovers differences of form of body according to their method of securing their prey. There are, for example,



A PIED-BILLED GREBE

The grebes dive for their fish and pursue them under water. Their powerful legs, with large lobed toes, are placed so far back that, although they are most graceful on the water, they are practically helpless on land.

those like the red-shouldered and red-tailed species, which find their quarry while soaring high in the air with their keen eyes fixed upon the ground. These have broad, rounded wings, fanlike tails and rather heavy bodies. Others, like the marsh hawk, beat back and forth close to the ground, seldom if ever soaring, and these have long, narrow wings and slender bodies. Still others like the Cooper's and sharp-shinned species, remain perched on some outpost awaiting the approach of their quarry and then dart out after it, and these have short, rounded wings for sudden bursts of speed.

Another group of animal feeding birds are those which feed upon fish, frogs or crayfish. Practically all have long, pointed, javalin-like bills for spearing their prey, but their various methods of catching the fish have brought about modifications of their other structures. The

A GREEN HERON NEAR ITS NEST

The bill is like that of the kingfisher, but the legs and toes are modified to assist it in stalking its prey through the shallow water.

herons and cranes, which catch their fish by stalking them in shallow water, have long, slender legs for wading and long toes to distribute their weight and keep them from sinking into the soft mud. The kingfishers, on the other hand, which secure their fish by plunging from above, have little use for their legs and these, following nature's economy, have degenerated. The terns, likewise, with similar habits, have weak legs, although webbed for swimming. The gulls, which have become scavengers and no longer plunge for their food, have developed somewhat hooked bills for rending the flesh of the larger dead fish upon which they feed.

Another of the fish-eating birds and one that plunges for its prey is the osprey, or fish hawk. This bird still retains the sharp hooked bill characteristic of its family and so, instead of spearing its fish as does the kingfisher, it catches them in its strong, sharp talons which work like a fish gaff. Furthermore the soles of its feet are modified in having sharp, horny tubercles to cut through

KINGFISHER WITH SMALL SUCKER

The bill is an efficient spear, and the legs, being of little importance in its method of fishing, have degenerated.

the slime covering the fish and keep them from slipping from its grasp. Others of the fish-eating birds, such as the loons and grebes, are expert divers and pursue the fish beneath the water. They have powerful legs with strong webbed or lobed toes situated far back like the propeller of a boat so that, although most graceful on the water, they are extremely awkward and almost helpless on land.

The group of insect-eating birds is large and varied for there are many kinds of insects and many ways of securing them. Some insects live in the soft mud about shores and marshes and for these the birds must probe; some live among the leaves and harder soil of the forest floor, and for these the birds must scratch. Others live in the trunks and branches of trees and in order to secure them the birds must be proficient carpenters, supplied chisels for gouging, and still others spend most of their lives darting hither and thither in the sunlight and these must be caught on the wing. Lastly, there are

A LESSER YELLOWLEGS

This bird is provided with a probe-like bill for finding its insect food in the soft mud along shores.

A RUBY-THROATED HUMMINGBIRD

Hummingbirds are provided with long, needlelike bills and hollow tongues for sucking the nectar from flowers. Some species have variously curved bills fitted to the corollas of particular flowers.

those insects which hide in the grass or among the leaves of shrubs and trees, and these must be searched out with keen eyes. And so, among birds, we have probers in the snipe, scratchers in the grouse and quail, borers in the woodpeckers, flycatchers in the swallows and nighthawks, and gleaners in the blackbirds, thrushes, vireos and warblers. In each group we find those modifications of bill, feet, wings, tail, tongue and eyes which best fit the bird for securing the insects in its particular way.

Among the vegetable feeders the largest number live upon seeds and are of rather generalized structure except for their bills which are heavy and conical like those of the well-known sparrow and carried to the extreme in the grosbeaks. There are a few birds like our hummingbirds, the tropical honey creepers and the African sun birds which take a large part of their sustenance from the nectar of flowers. These birds have slender probe-like bills and tubular tongues modified so as to be best fitted for sucking the nectar from the various-shaped corollas. Among the five hundred odd species of hummingbirds, we find almost every conceivable variation in the form of the bill, from those like Docimastes, with probes nearly three inches long for sucking the nectar from large tubular flowers, to those of the tiny Rhamphomicron, with a bill scarcely half an inch in length, so short that the hummer alights on the base of the flower and pierces the nectary in an unlawful way. A few have curved bills, one almost sickle-shaped, and others slightly upturned bills, and all are modified for feeding on particular flowers.

Finally, there are birds which feed almost entirely upon fruits and a few, the sapsuckers, which derive most of their nourishment from the sap of trees. This they secure by drilling series of small holes through the bark and establishing regular "sugar bushes," visiting the different trees as often as the sap collects. Occasionally, in the heat of the sun, the sap ferments and the unsophisticated sapsuckers are treated to a beverage which rapidly causes them to act in a questionable manner. In fact, they have been known to become so confused as to mistake a man's leg for the limb of a tree. The sapsuckers are degenerate woodpeckers, and although they retain the characteristic bill, feet and stiff tails, their tongues, instead of being greatly protrusible, spearlike and armed with barbs as in the true woodpeckers, have become split and brushlike for better gathering the sap.

A HOUSE WREN

This is one of the birds that finds its food by gleaning about the leaves and branches. Its finely pointed bill is a perfect forcep for picking off the squirming caterpillar or the smallest insect egg.

A YELLOW-BELLIED SAPSUCKER

This misbehaving member of the bird family is at his "sugar-bush." Sapsuckers are degenerate woodpeckers, and, like other degenerates, they sometimes become intoxicated by drinking fermented sap.

Were we to consider fully the food of all species, we would discover that there is scarcely an animal or vegetable substance that does not furnish the food of some group of birds. Between the loons and grebes that find their food at the bottom of the lakes, and the swallows that dart above the trees, there are birds probing in the soil, scratching its surface, turning over the fallen leaves, gleaning through the grass and herbage, searching the

leaves and twigs of shrubs, chiselling in the trunks of trees, and climbing about the branches; and each bird has some adaptation, some modifications, that fit it to its own peculiar food and method of securing it.

BIRD LIFE IN FEBRUARY

To all appearances it is still winter and, with all respect to the ground hog, we are likely to have some very cold weather. Perhaps we may yet have our heaviest snows. Bird life too, still presents its winter aspect. The snow buntings, redpolls, and tree sparrows linger about the snow-covered fields and there are yet no signs of returning migrants. It is during February that one learns to expect some of the more unusual winter visitors. Having consumed the food supply of their natural hunting grounds, many species are given to roaming toward the close of winter, appearing far out of their normal range. Pine and evening grosbeaks, Bohemian waxwings, longspurs, crossbills, and snowy owls may be looked for almost anywhere.

Before February has run its course, however, we can expect some uneasiness to be shown by the earliest spring

A TREE SWALLOW

The swallow is teaching its young to capture insects on the wing. Swallows and other fly-catching birds have large mouths, and with their powerful, pointed wings they are experts at catching insects in full flight.

migrants. The horned larks will move northward and become numerous up to the Canadian border, and through the South the robins and bluebirds will desert their accustomed resorts and push toward the icy barrier. If the last of the month is open, the early birds may reach the northern states before the last of the month, perhaps

A CARDINAL GROSBEAK

Here is a bird with a bill fitted for cracking seeds. Although the bill is heavy, it is finely pointed, and does not prevent its owner from feeding on insects during the summer.

only to meet with distress when overtaken by the sleet of some March storm. But they are the harbingers of spring. Grim Winter has lost his grip and they have come to shout defiance. Let them be welcome.

CONTROL OF LARCH MISTLETOE

IN the forest regions of the Northwest mistletoe is so abundant that the damage which it does assumes at times a serious aspect. Recent investigations of the United States Department of Agriculture have shown, for example, that the deterioration of the western larch in the more open and exposed stands of the Whitman National Forest in the Blue Mountain section of Oregon is due to mistletoe. Although not so valuable as yellow pine and Douglas fir, the larch, when free from mistletoe, produces large saw timber. Trees attacked in early life by the larch mistletoe, however, seldom produce a good grade of merchantable timber, and all infected trees show poor health and reduced diameter or height.

In a professional paper of the United States Department of Agriculture, Bulletin No. 317, it is recommended that in making timber sales, all larches affected with mistletoe be cut, whether the trees are merchantable or not. The effect of thinning is to promote the development of the parasite in the crown. It is desirable, therefore, to cut all infected trees, so far as this is practicable, in lumbering operations.

A NEW FORESTRY COURSE

Three hundred and fifty-four students of the University of California have enrolled in the course in the "Elements of Forestry," offered this year for the first time by Professor Walter Mulford. This course is designed to present a general picture of the relation of forestry to the every-day life of a nation.

The Association's New President

Charles Lathrop Pack, Forester, Conservationist and Financier, Elected President of the American Forestry Association

MR. CHARLES LATHROP PACK, of Lakewood, N. J., was elected president of the American Forestry Association at the thirty-fifth annual meeting, held in Boston, Mass., on January 17 and 18, and accepted in a happy inspiring address, which was received with applause and followed by proffers by the members of hearty co-operation in the work which he has undertaken.

Few men possess the qualifications that will be brought to the office by Mr. Pack. His training has been broad and comprehensive and his ability as an executive is widely recognized. In the various fields of forestry, finance, and the details of general business organization, the new president has qualified as a specialist. His administration will be well rounded for the simple reason that he will see every part in its relation to the whole. On his work he will bring to bear a mind quick to grasp probems as they may arise and a keen sense of proportions that will enable him to achieve ready appraisal of relative values. To these are added a vast capacity for work, a determination that overcomes difficulties and the ability to command tireless cooperation from those with whom he may be associated. Thus equipped, he enters office with broad achievement assured.

In matters pertaining to forestry Mr. Pack is a figure of national prominence. His interest dates back to the time when the scientific forester was unknown in this country. It was as long ago as 1878 that he made his beginning as a specialist along this line. His experience and training before that time had made him familiar with trees as such, and with forests as a basis for lumbering operations. In his boyhood he had spent much of his time in the white-pine forests of Northen Michigan, and in the woods along the Spanish River in Canada. As early as 1874, 1875 and 1876, he lived in the woods with Tom Smith, a veteran of the forests, under whom he received his first instructions in estimating timber. One of the most vivid memories of these days has to do with the keenness and accuracy of Smith's judgment as to quantity and quality of standing timber, and Mr. Pack has always considered himself fortunate in having had this expert as his first instructor.

The year 1878 found Mr. Pack in the forests of Northern Bohemia and in the Black Forest. It was his good fortune to have a letter of introduction to Herr Katz, who lived at Gernsbach, Baden. Herr Katz invited him to remain for some time at Gernsbach, and extended many social courtesies, as well as giving him unlimited professional opportunities as a student. It was here that Mr. Pack had his first real vision of conservation, a vision that was destined to have an important influence on his after years. He says himself that theretofore he he looked upon the trees of the forest simply from the standpoint of their potential value in money. Now he began to see their value as a permanent national resource.

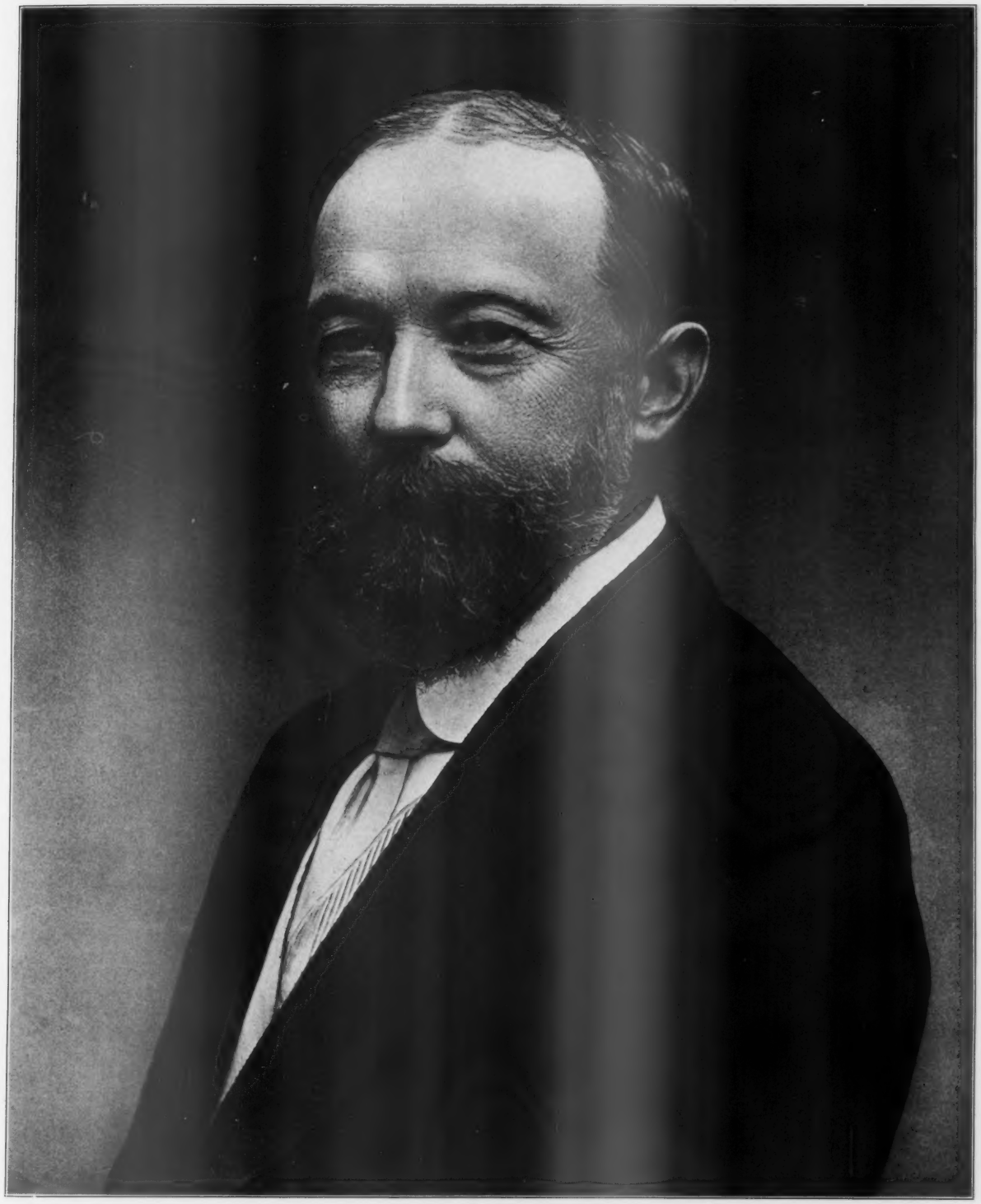
During his period of European study he formed the acquaintance of the forester of Karlsbad and spent the larger part of the summer with him in the forest property belonging to the city of Karlsbad and in visiting other similar properties.

In 1882 Mr. Pack spent a good deal of time in the forests of the Southern States, particularly in Mississippi and Louisiana. It was in December, 1882, that he first discovered that the long-leaf pine is only slightly injured by forest fires. As an experiment he set fire to the forest floor in several localities and watched the result. He had been accustomed to see white pine seriously injured and even killed by small fires, and his enthusiasm was intense when he found that the large, long-leaf pine remained almost uninjured after a hot fire. This discovery had an important bearing on Mr. Pack's career. When he had convinced himself that the financial risk from loss by fire was relatively slight, he realized that the ownership of long-leaf timber could not fail to be profitable. Thus entrenched, he was able to induce a number of men to make investments in Southern timber. His efforts played an important part in the development of the Southern territory.

It was in 1882 that Mr. Pack received what is believed to have been the first large fee ever paid in this country for the technical services of a forester. The fee was paid by Jay Gould, then a conspicuous figure in the railroad and financial world. Mr. Gould was considering the purchase of a large area of land from some land-grant railroads and required technical advice. At that time the forestry expert or engineer was unheard of in the United States. At the request of Mr. Gould, Mr. Pack gave the information and opinions that were needed, and he takes a pride in the recollection of the check for $1,000 sent him by Mr. Gould for his services.

Mr. Pack was an early advocate of perpetuating the forest resources of the nation. He was one of the first in the country to maintain that a forest should be regarded as a crop, that the ripe timber should be harvested, and that it was the young trees that demanded protection and encouragement. His early views on this question are now universally accepted and have played an important part in the National Conservation movement in which Mr. Pack has been one of the recognized leaders.

The American Forestry Association has reason to feel an especial debt to Mr. Pack for his achievement in the interests of forestry during his term as president of the



CHARLES LATHROP PACK

Elected president of the American Forestry Association at the thirty-fifth annual meeting at Boston, Mass., January 17, 1916.

National Conservation Congress. By reason of his deep interest in the subject and his broad understanding of its problems, Mr. Pack caused much of the work of the Conservation Congress of 1913 to be devoted to the study and discussion of forestry. A special committee spent an entire year in research, and the published reports of the various sub-committees have taken an important place in the national literature on this subject.

Mr. Pack has been a director of the American Forestry Association for several years. He has always been active

in its work and his counsel and advice have been highly valued. As president he will have opportunity for the constructive work for which he is noted, and there can be no doubt that the results of his administration will prove gratifying to the members and friends of the association. He has always taken deep interest in movements for national progress. He was one of the organizers of the World Court Congress, held in Cleveland, in 1915, to further the cause of the world peace along the lines of an International Tribunal. He is now vice-president of the World Court League and a member of the National Institute of Social Sciences.

PRESIDENT PACK'S ADDRESS

President Pack, in response to the toast, "The New President," at the joint forestry dinner at Boston on the evening of his election, said:

"I need not tell you of the splendid work and sturdy qualities of President Drinker. He has served the American Forestry Association with ability and rare tact. The cause of forestry has no better friend. He has set a high standard for the office with which you now honor me. All that I can say, my friends, is I shall do my best to live up to his ideals.

"We are here to consider some of our forestry problems. We recognize the important present and future value of the effort made under the Weeks Law to save the forested lands of New England. This practical and patriotic work should go forward both north and south. It means much to the farmer and the citizen. In this way the interests of the forests and the farm go hand in hand. You are not for standing still, I am sure, on a matter of such vital interest to all our people. The men and women at this meeting are a forward-looking people and it is for you to see to it that the work under the Weeks Law is perpetuated, all honor to the statesman and Senator from Massachusetts; but he needs help, he needs your help; see that he gets it.

"It has been said: 'In time of peace, prepare for war,' but in this matter of forest resources of this country, had we not better say at this time: in time of war, prepare for peace? We must mobilize the industrial resources of this country if we are to go forward as a nation in proportion to our opportunities. Indeed, I think it may be said that after this terrible world war is over the industrial competition will be far-reaching, and for us there will be a victory or defeat just in proportion to our preparedness. If we are unworthy, we shall fail. The forests and forest products will play a large part. A treeless country or a country which abuses its timber resources as we do cannot expect in world competition to continue with economic success.

"In this time of the Great War we become used to unusual things. During the past year more than one hundred and fifty million feet of lumber have been exported chiefly from the gulf states for the uses of the armies in England and France. American lumber may now be found in the war zone of Northern France sheltering the French and English from the rigors of winter. American lumber was recently taken by the allies of the entente powers to Salonica in Northeastern Greece. It was the export demand for lumber of this character which a few months ago gave a little stimulus to an industry which was prostrate and suffering from the economic conditions which prevailed in this country before the war.

"As late as the seventh century Tripoli was clothed with vineyards and forests and had a population of 6,000,000, but the forests were cut down—and the region is now bare, and the population reduced to a fraction of the former number.

"Spain, well stripped of its forests, has but a fraction of the population which thrived there when it was covered with forests, and was one of the greatest nations in the world.

"Greece has less than a quarter of the population it had when covered with forests, and when it produced the leading statesmen, scientists and writers of the world. Greece in her golden age, was a gloriously wooded land.

"The Island of Mauritius, in the Indian Ocean, was in 1865 considered as a pearl in the ocean, but the forests were cut down to make room for sugar plantations. The streams dried up, the equable climate changed, rains decreased, drought ensued. Then trees were planted, forests are now growing and the island is again becoming the Pearl of the Indian Ocean.

"On the other hand we are told the Mormons found Utah largely a treeless country. They planted trees and have greatly increased the rainfall and the flow of streams and the fertility of the soil by planting forests and orchards.

"Next perhaps to war, taxation is the most powerful instrument of government, capable, if unwisely used, of destroying individuals, communities and industries. Few government functions are less studied by the average citizen, and probably none of its branches less understood, than forest taxation. It is everywhere recognized by foresters, tax experts, and political economists that the general property tax applied to the forests of the United States is unscientific and discouraging to conservative management. The general property tax upon timber has an alarming tendency to become excessive. It is exceedingly difficult to meet because it is imposed annually, while revenue with which to meet it is deferred. This system of taxation has a great tendency under most conditions to hasten the cutting and marketing of the forests. The question of forest taxation is one of the most important and vital in the consideration of the economics of forestry. We cannot expect individuals or corporations, or even cities or towns, to continue to perpetuate an unprofitable experiment. There must be some return on the capital invested. In most of our States instead of timberlands being favored in order to encourage their growth and conservation, not only for the benefit of the owner, but for the use of the people of today and posterity, they are not given an even chance with other properties. The crop of the farmer is taxed when it is ready for the market and no

agricultural crop is taxed more than once. The crop of timber is taxed continually and each year until it is cut. The farmer's crops mature annually; the crop of the timber owner matures once in many years. In this connection I want to commend to the students of the subject, the report of the Committee on Taxation, of which Mr. E. T. Allen served as chairman at the Fifth National Conservation Congress.

"In this country we have been used to too cheap lumber. A thing that is cheap is rarely properly esteemed. Lumber is sold, not at the cost of reproduction, but at only a part of that cost—the cost of discovery and exploitation. To my mind the deplorable condition of our forests in many of the lumber regions of this country is due to its uneconomic use and to the cheapness of lumber. The coarser grades of lumber are so low in price that a large proportion of the value of the fallen tree is left in the woods where the possibility of its economic value ends forever. Foresters, lumbermen, what I want to see is a real conservation of the fallen tree. I should like to emphasize the statement that the perpetuation of our forests and the unremunerative prices of lumber cannot travel together. This is not a popular theme; many of our politicians prefer to dodge the fact. A low estimate of the value of timber left to rot or burn in the woods in this country is more than 100 million dollars per year. The reason this lumber is not saved but is wasted is because it would cost more than 100 million dollars to save and market it. In countries where forest products sell at cost of reproduction plus a small profit this great waste would be saved.

"It seems to me that the farm and forest must go hand in hand. Coal once used cannot be returned; iron once used cannot be put back into the ground; and once used are gone forever, and then the most that can be done is to use them carefully, making them go as far as possible. All our natural resources are of importance, but on the forest I believe more depends than upon any other one natural resource. You tell us iron, coal, other minerals, are rapidly giving out, yet no one has suggested a remedy except to be careful, but the forests can be protected and the waste places reforested. This is our great need of the present time. The future prosperity of our people depends upon it because our farms depend on it. If you travel over this great country you will find in so many places the same conditions existing, the same wasting of the natural resources of the country; the rivers running unused to the ocean—waterpower speeding to the sea without economic use, the forests disappearing, the mines being exhausted, and in but a few of the states has anything really been done to retain and perpetuate these things which are of the most importance, not only to those of us who are here, but also to our children and successors. It is to do our utmost to remedy these evils that brings us here. To this patriotic work of economic preparedness the endeavors of the American Forestry Association are dedicated.

"And in closing, let me say a word about the human side of forestry.

"The American forester, and all true frequenters of the woods, are men of artistic feeling. The tree has ever been the symbol of life, strength, beauty, and the eye of man cannot continue to look day after day upon these stately trees—God-given monarchs of nature—without their beauty being reflected in his life, making him a healthier, happier and better man, and their destruction means not only the removal or decrease of one of our natural resources, from a practical and utilitarian standpoint, but from the view-point of health, morality, spirituality, happiness and beauty. There is no compensation for such a loss."

FOR WOODLOT IMPROVEMENT

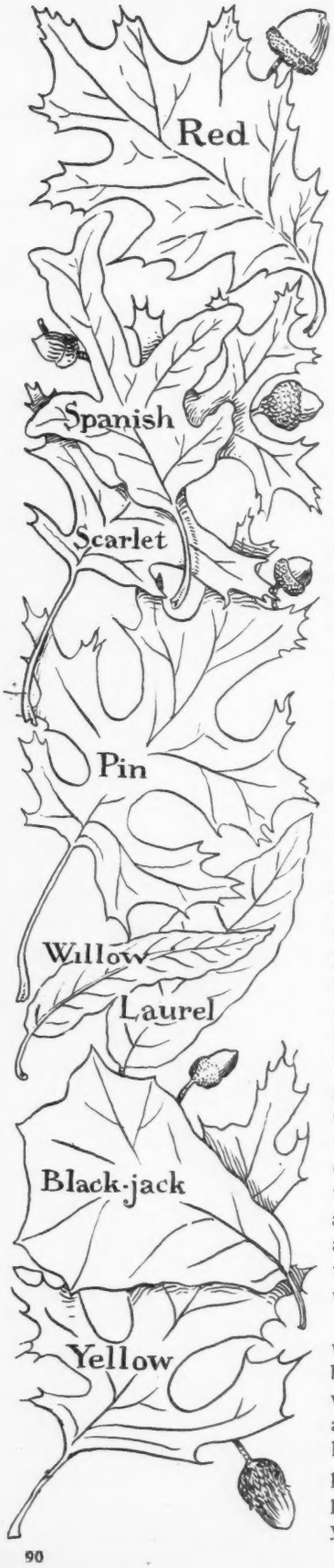
THE combined efforts of the New York Conservation Commission and the State College of Agriculture at Cornell should go a long way toward developing ideal woodlot conditions in Broome County, New York, according to a bulletin just issued by the college. This bulletin is the result of a careful survey of the county by the Cornell forestry department, and gives the condition of the county's woodlots and other bodies of timber, with suggestions for their management, so that they will yield a profit to their owners. Lists of trees suitable to this section of the State are given, together with the information that the State Conservation Commission at Albany will furnish such trees in quantity at cost.

In order to furnish demonstrations of applied forestry, two plots have been selected and marked—one in the town of Windsor, on the property of F. L. Goodenough, and the other about ten miles from Binghamton, on a farm owned by C. O. Chase. In each of these plots the owner has agreed to make certain improvement cuttings and to allow persons interested to inspect the work being carried on there.

A copy of this publication, Bulletin 366, may be obtained by any resident of New York, without charge, upon application to the New York State College of Agriculture, Ithaca, N. Y.

THE ANGRY TREE

DID you know that a tree can get angry? There is a kind of acacia in Nevada that not only is "touchy," but as the gardener put it, "goes very mad," says a writer in *Answers*. It is about 8 feet high, and is a very rapid grower. When the sun sets it is ready to go to sleep, shuts its leaves together and coils up its twigs just like a pigtail. If any one pulls that tail—well, the tree doesn't squeal, but it flutters and moves uneasily, and seems to be deeply agitated. If it is ever disturbed by a shock, such as transplanting, the leaves stand out in all directions and quiver violently. Strangest of all, they send out a pungent, nauseating odor that is most unpleasant. It takes this bad-tempered tree an hour or two to get back into good humor.



Children's Department

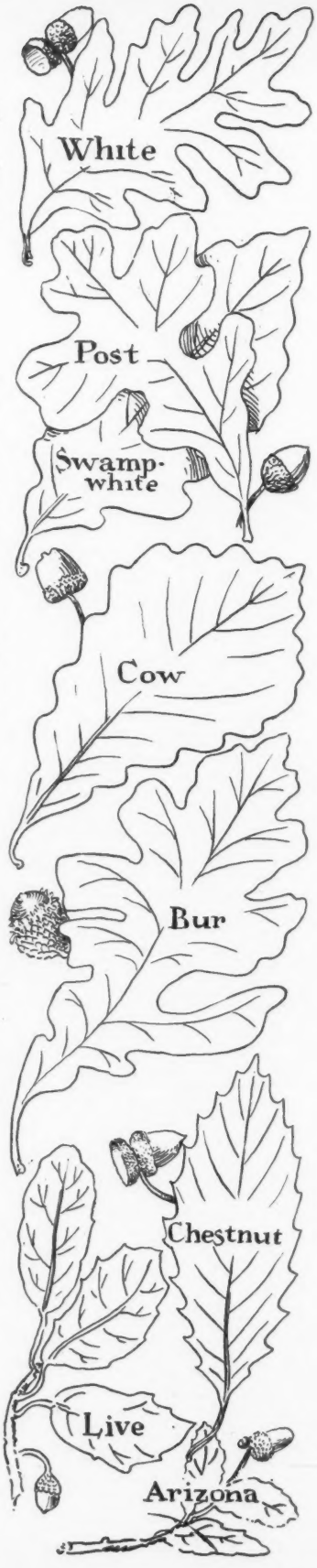
Devoted to imparting information about trees, woods and forests to boys and girls, so that they may grow to know how necessary trees are to the health, wealth and future of their country.

By Bristow Adams

OUR OAKS

MOST persons who study trees try to group them according to their relationships, which, of course, is the only wise plan for a strict study. But since we are not so much interested in the relation of trees to one another as we are in the relation of trees to man, we shall in this department group trees according to their uses. Lumbermen rather than botanists have taken to this plan, and have first classified trees as hardwoods and softwoods, although those trees which they call softwoods—the ones which bear cones and have needle-like leaves—do not always furnish the softest lumber. There is the general division of the two great types of trees, most familiar to all of us, into evergreens and deciduous, or trees which drop their leaves in winter, with the general understanding that the evergreens are the cone bearers. Yet here again are exceptions because there are a number of cone-bearing trees like the larch and the cypress which lose their leaves in the winter just as the beech and the maple lose theirs. Then, too, there are the broad-leaved trees, like the magnolia and the holly, which are evergreen. The term "deciduous" is usually applied only to the broad-leaved kinds. Thus it can be seen that most of the general names fail in one way or another to classify the various types. In this department we shall first divide the trees into the two general classes understood by the lumberman's term of "hardwoods" for broad-leaved trees, and "softwoods" for the cone bearers, such as pines, spruces, hemlocks and the like, whether they keep their leaves through the winter or not.

When one thinks of the hardwoods—woods which have been of the greatest use to man because they are hard, and strong, and will wear well under constant use—the oak naturally comes to mind. It has served man since he first began to use wood at all, and it is probable that even before tools were invented, primitive man discovered that a well-seasoned young oak, was, because of its hardness,



weight, and toughness, a most serviceable implement as a staff or a club. It was when he began to make dwellings, however, and to construct boats with which he might travel the seas, that the oak assumed its greatest importance. In structures of all sorts on land and in vessels for sea-faring, it has been one of the most enduring of all woods, and the oak has lent itself readily to a greater variety of uses than any other tree, except, possibly, the palm and the bamboo.

THERE are several hundreds of oaks, and there are about fifty-five in North America. The lumbermen and the botanists both are argeed on two types—the white oaks and the black oaks, the division on the part of the lumbermen being made on the basis of the color of the wood; yet the color of the wood of the white oak is not white, nor is that of the black oak black, but is more likely to be of a reddish tinge, and the trees in the black-oak group are known also as the red oaks.

The main differences between the two groups are that the trees of the red or black-oak variety need two years to mature their acorns, and the divisions along the leaf margins terminate in points. In the white-oak group the acorns are matured in one year and the divisions, or lobes, are rounded. In general, however, it may be said that the leaf forms of the oak are not standard.

The one feature which can be relied on to distinguish the group is the acorn and cup, even though the acorn cup is comparatively small with some forms, and in others the cup almost entirely surrounds the acorn itself. Some idea of the variations of the oak leaves may be seen in the fact that the white oak, for example, has a leaf with rather deep indentations with rounded edges, while the red oak and the pin oak have similar deep indentations with pointed lobes. The leaf of the live oak, an evergreen, has very shallow indentations, and is not unlike that of the holly, with sharp spines along its edges. The willow oak is so named because of its long, narrow leaf that has no divisions and has the general look of the leaves of some of the willows. The laurel oak has a similar leaf, which is larger and broader than that of the willow oak. The chestnut oak is so called because its leaf closely resembles that of the chestnut tree.

THE oaks have a wide range through the country, though they do not grow as far north as the willows, for example. The common white oak and red oak grow all through the eastern half of the United States. The willow oak is not hardy in the Middle Atlantic and New England States, which is a great pity because it is one of America's handsomest shade trees. The live oak grows from Virginia to the gulf coast and westward to California. California has its own peculiar species—the tan-bark oak, which grows among the redwoods, which are also limited to the Golden State. In the Southwest there are many different kinds of oaks, but most of them are dwarfed by the severe conditions in which they have to live, and form a part of the elfin forest of that part of the world, and generally known as chaparral.

See how many different kinds of oaks can be found near where you live. There is no special place to look for them because different kinds will grow either in low, moist situations or on top of the driest hills, or at many places between these two extremes.

TOWER FALLS OF THE YELLOWSTONE

THE Tower Falls is one of the most beautiful waterfalls in the United States, which is the less often seen by travelers to the Yellowstone region because of its relative inaccessibility. The fall itself is a magnificent sheer drop of milk-white, foamy water, but

Photograph by Iddings, U. S. Geol. Survey.

THE TOWER FALLS

The milky whiteness of the Tower Falls of the Yellowstone, the dark green of the nestling trees and the protecting strength of the surrounding mighty rock towers combine to form a beautiful and inspiring sight.

the great beauty and majesty of its setting are what also fascinates. The river pours forth from a group of mighty rock towers rising nearly 2,000 feet above the bottom of the canyon, forming spires and pinnacles, with massive bases of granite; but clothed here and there with the dark green of the mountain pines and firs. Some 20,000 horsepower might be developed from these falls, but the iron hand of the Government wards off all private spoliation of this great natural wonder, the entire Yellowstone region being permanently reserved for the benefit and enjoyment of all the people for all time.

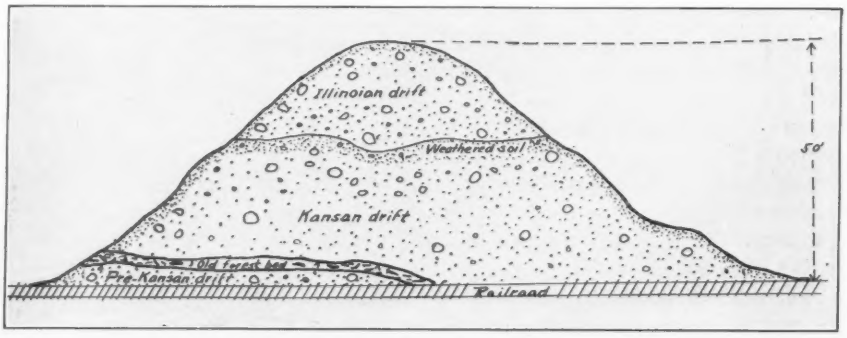
Wood Older Than the Hills

By Arthur Koehler

Expert in Wood Identification, Forest Products Laboratory, Madison, Wisconsin

SPECIMENS of wood, which are veritably older than some hills, have recently been unearthed in a railroad cut at Woodville, in St. Croix County, Wisconsin. The wood, somewhat mixed with black soil, was found in a layer four to twelve inches thick in the base of a hill fully fifty feet high.

Some fragments of the wood were sent by Mr. S. Weidman, of the Wisconsin Geological Survey, to the Forest Products Laboratory, Madison, Wisconsin, for identification. The wood was very brittle and much distorted, most of the cells being flattened. However, by cutting thin sections of the wood and viewing them through a microscope, the characteristic structure of the cells could be made out. The wood proved to be spruce.



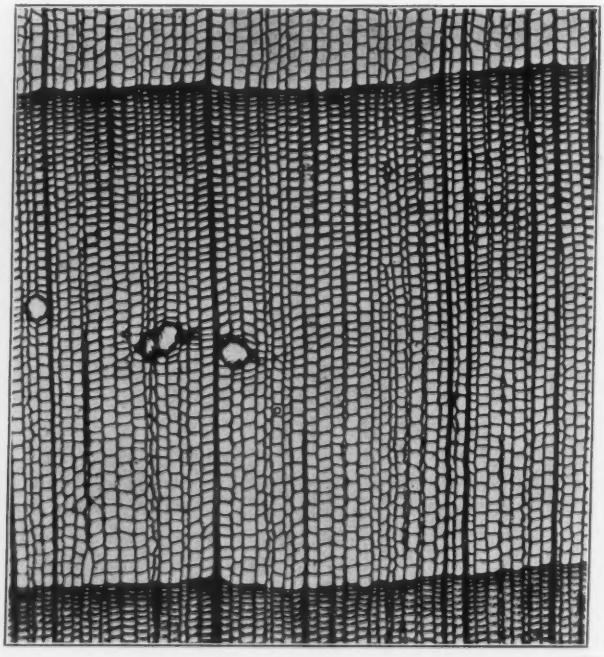
WHERE 500,000 YEAR OLD SPRUCE WAS FOUND

Note section of this diagramatic sketch of a railroad cut near Woodville, Wisconsin, marked in the sketch "Old Forest Bed." It was in this bed that specimens of the spruce, estimated to be 500,000 years old, were found. The explanation of how they came there is given in this article by Mr. Arthur Koehler, of the Forest Products Laboratory, Madison, Wisconsin.

Geologists explain the occurrence of the wood so far under ground something like this: Ages ago a thick sheet of ice (glacier) covered the greater part of the State of Wisconsin and neighboring States, and moved slowly southward. Heavy masses of ice will "flow" in the same manner in which a brittle piece of molasses candy will gradually spread out on a plate. At the end of the

CROSS SECTION OF SPRUCE 500,000 YEARS OLD

This is a photomicrograph of spruce, magnified at 50 diameters, found in a glacial drift in Wisconsin. It grew there, expert geologists estimate, about half a million years ago. Most of the cell walls are wrinkled, although a few cells which were infiltrated with limestone retained their normal shape.



CROSS SECTION OF NORMAL SPRUCE

Photomicrograph of present-day spruce. Note the difference between it and the prehistoric specimen recovered from the glacial drift. Magnified fifty diameters.

glacier, where the ice melted, it deposited a great amount of soil, which had become mixed with the ice in its journey southward.

This lower deposit at Woodville is designated as the pre-Kansan drift. The time came when the lower end of the glacier melted faster than it could move, and consequently the terminal margin receded northward, allowing vegetation and even trees to encroach upon the deposit. The fact that the wood which was found is spruce, however, indicates that a moderately cool climate prevailed, for even now this species is confined chiefly to the northern latitudes and high altitudes.

Later, probably some 500,000 years ago, the climate again became cooler, allowing another glacier to come down. The forest was destroyed and buried under a mass of ice and gravel. Again the glacier was melted and deposited a deep layer of soil, forming the Kansan drift, on top of the remains of the forest. Long after the Kansan drift was deposited on the forest bed a third glacier descended and later receded, depositing the Illinoian drift.

These theories may seem "far fetched" to those who have not studied the formation of our land areas, but to the geologist they offer the only logical explanation of present conditions. At the present time in Alaska some glaciers are slowly pushing their huge ice masses along to the utter destruction of all forests and other plant life in their path. Other glaciers are being melted faster than they can advance, and, consequently, their terminals are receding and depositing large masses of earth and stones.

HOW BIRDS PLANT TREES

DR. M. W. BLACKMAN, Professor of Forest Entomology, Dr. L. H. Pennington, Professor of Forest Botany and Dr. C. C. Adams, Professor of Forest Zoology in the New York State College of Forestry at Syracuse University attended the meetings of the American Association for the Advancement of Science held at Columbus, Ohio. Dr. Adams, while there, read a paper before the Wilson Ornithological Club on the relation of birds to the Adirondack forest vegetation. He spoke of the damage done by sap suckers to aspen, yellow birch, beech, hemlock, etc. He brought out the fact that much burned over land is planted through the action of birds in carrying certain seeds; especially is this true of bird cherry. This bird cherry forms a temporary cover on otherwise barren soil, preventing erosion and acting as a nurse crop for future forest trees. The Ecological Society of America was organized, Dr. Adams acting on the organization committee. One hundred botanists and zoologists are charter members of the society.

SAMPLE COPIES OF AMERICAN FORESTRY

MEMBERS of the American Forestry Association having friends interested in trees, woodlands and forests are urged to send their names to the association and a sample copy of the magazine, AMERICAN FORESTRY, will be sent to them with the compliments of the member.

THE COWLED MONK

THE human face is found in many natural rock carvings in different parts of the world, and almost western State has one or more of these natural statues, carved so perfectly by the action of the elements as to be startling in their expressions. Perhaps none is more striking than the "Monk's Head," in Coony Can-

Phtograph by Searle, U. S. Geol. Survey.

THE COWLED MONK

There are hundreds of rock faces in the United States, but perhaps none is more striking than that of the Cowled Monk in Coony Canyon, New Mexico.

yon, New Mexico, a freak of nature that brings out in clear profile a man's face, with the head appearing to be hooded. The figure is of giant proportions, and at a little distance, sharply outlined against the sky, it seems impossible that it is not the work of some ancient people who may have wrought upon it with crude tools, yet obtaining a singularly strong and virile expression of countenance. Fantastic tales are told by the New Mexico Indians concerning the origin of this rock head, and at one time it was believed to have been worshiped by the natives of the Southwest. The photograph was taken by Engineer A. B. Searle, of the United States Geological Survey.

KENTUCKY'S FORESTRY BUILDING

STATE FORESTER J. E. BARTON, of Kentucky, has inaugurated a plan for the erection of a permanent forestry building on the State fair grounds, the building to be erected of wood donated by the timber interests of the State. His plans call for the exterior to be of the rustic wood and the interior showing the grain of the various woods. He has met with splendid encouragement and the building is practically assured.

INSTRUCTING CHINESE STUDENTS OF FORESTRY

The teachers in these schools are young men who have been trained in forestry schools of the United States, and the reforestation of eastern China and the lumbering of western China will follow methods approved in this country. The forestry movement in China, while only a few years old, is making excellent progress despite the great difficulties to be overcome.

Lecturing in Chekiang

By D. Y. Lin, M.F.

[Part of the enormous task of providing for the reforestation of denuded China is to first educate the people on the necessity for conservation and for reforesting the non-agricultural lands. Owing to the fact that there are few newspapers or other publications, it is necessary to do this by lectures and addresses. It is this character of the work and its effects which Mr. Lin describes in the accompanying article.—Editor.]

IT was on the 24th of May that we received word from H. E. Governor Kyüih that he would like to have me accompany him on his tour of inspection in the northern interior of Chekiang. The tour lasted two weeks, and we took in the principal cities, Kienteh, Lungyu, Tsaryen, Lanchi, Chüchow, and Kinwha, all along the Tsientang.

The Tsientang is the chief river of Chekiang. Rising in the western hills of the province, it follows a generally northeasterly direction and falls into the Bay of Hangchow. Its basin occupies nearly half the province, and by means of boats and rafts the river serves as a means of communication for many hundred miles. Small steam launches can go up as far as Tung Loo, but after passing that point small boats and rafts have to be used. Often the river gets very shallow, with many rapids, and it was a sight to see the boatmen heaving and yelling as they worked to get their boats past such places.

Mountain scenery along the Tsientang is superb. The whole region has been called by some writers "a most varied and charming hill country, which doubtless some day will be as well known to the tourist as the Japanese hills." Beautiful these hills and mountains are, but when going through them one cannot help noting how treeless they have become, and how they are just a picture of wanton deforestation. Small patches of pines could be occasionally seen marking the place of graves. The Governor frequently remarked on these scattered clumps of trees and said sarcastically, "Those are for the benefit of the dead, who are thus better provided for than the living." Some of the mountains are depleted entirely of tree growth, and frequent fires have gone over them so that the effects of erosion and gullying are visible from a distance. In the vicinity of Lungyu hundreds and hundreds of acres of hill lands have been left practically bare of all vegetation. This land could be easily forested and made into productive timbered land, and a protection for

the farmlands below. In Shan teu, a little village near Lanchi, a long range of mountains is entirely devoid of tree growth, with streaks of exposed, reddish soil everywhere seen. The people are suffering not only from economic effects, scarcity of wood and fuel, as a result of this ceaseless cutting and burning over these hills and mountains—forest fires were everywhere noted—but also from physical effects. Water and forests are very closely connected. Without forests, water cannot be permanently regulated; floods, erosion, and mechanical depreciation of soil will be the result. The people of the different places visited are full of stories of how their rice fields are at the mercy of floods, their fruit orchards often made worthless through gullying, and how the irregularity of the flow in the Tsientang has been a great hindrance to their traffic and trade.

Now, it was in such a region that Governor Kyüih wanted me to lecture to educate the people on the importance and in the methods of conservation or development of forests. My lecture was a demonstrated one, and was well understood by the natives. Everywhere I spoke the leading men and students made up the audience. In most of the places, public meetings were unknown, and in such places we had hard times finding suitable halls. On our arrival in the towns the Governor would send out proclamations regarding the lecture and as a consequence the capacity of the hall was always taxed.

In Kienteh the lecture was held in the Anhwei Guild Hall, the largest in the city, and even then it was necessary for the lecture to be repeated to a large overflow crowd which could not get in for the first lecture. In Tsaryen the largest temple in the city was given me as a lecture hall. I stood surrounded by my charts and apparatus in front of towering idols. The attendants whom the local magistrate had provided for my assistance did not hesitate to hang some of the charts from the gilded idols themselves. It must have been a strange sight to the audience, but it was one of the most interesting experiences of the trip. There were not seats enough, so soldiers bearing the magistrate's card were sent from house to house to borrow chairs to seat the audience. Meetings in Lanchi, Lungyu, Chüchow and Kinwha were equally successful.

In Chüchow the meeting was held in a large theatre and the audience numbered about eight hundred. Kinwha, the last city in which I spoke, has many schools, and the Governor suggested that I speak twice, so all the students might hear. Notices were sent out to that effect. There was a terrible downpour of rain at the hour I was scheduled to speak, but in spite of that there were about a thousand people present at the two meetings. Altogether, there were about four thousand people who heard the lecture during the itinerary, and this is significant when we think that these audiences were made up of leading men, officials and students.

The most unique feature of this trip was the Governor's tree-planting ceremonies. In all places visited he planted a few trees in the presence of a few officials and leading gentry, to mark his visit and show the importance of forestry. The planting ceremony generally preceded my lecture and I never failed to call the attention of the audience to the importance of the work of the Governor and tell them it was his sincere wish that they cooperate to give proper emphasis to forestry. After each of my lectures, a discussion would follow, in which some of the local forestry problems would be brought up for consideration, and I only regret that I could not have stayed longer in each of the cities to study these problems, and to offer practical suggestions if desired.

Coming back to Hangchow, where all the schools, colleges and societies had been instructed by the Governor to line up to hear me, I gave a series of ten lectures in the auditorium of the Government Law School. Although the weather for the week was not favorable, yet the numbers that came to hear were far from discouraging. There were 1,840 of the leading gentry, officials, and older students who attended. One of the lectures was given exclusively to the girl students, and it was most gratifying to note that some of them came with paper and pencil and had been instructed by their teachers to take notes and ask questions regarding conservation. By far the most important meeting in Hangchow was that principally for discussion, in which about 150 leading men of the city participated. Mr. Wen, Commissioner of Foreign Affairs for Chekiang, was chairman of the discussion meeting, and the purpose of the meeting may be summed up briefly in his eloquent words: "Now we have heard enough about conservation of forests, their value in human economy, and the effects of deforestation and wanton use of our non-agricultural lands. Mr. Lin has within the last few weeks planted enough trees in our brains. Time for action has come and it behooves us to take these trees from our brains and transplant them on our many denuded hills and mountains around." The spirit with which these leading men brought different problems up for discussion was indeed exemplary, and one would wonder why a forestry movement had not been started earlier among them.

The results of my three weeks' continuous lecturing on conservation have certainly been most encouraging, and they may be summarized as follows:

1. Seven (7) cities visited and as many as 5,840 leading merchants, officials, and students reached.

2. Movement for formation of a Forestry Association for Chekiang is now under way. And what is still more encouraging is that some of the leading men in Hangchow are going to start, with their own money, a demonstration forest on one of the hills by the famous West Lake. It is their hope that the forest may some day serve to demonstrate to the people of Hangchow the advisability and practicability of reforestation. Here we wish them the best of success.

3. The Civil Governor has taken definite steps. He has issued proclamations to the seventy-five local magistrates, instructing them each to plant at least 150 *mow* every year, and to enforce the Central Government laws, as adopted last year. The following is a very rough translation of parts of the Governor's 1,220 word note to all the local magistrates:

"After a tour of inspection, which I undertook at the

request of the President and the Ministry of Agriculture and Commerce, I have been led to believe that mountain lands throughout the province of Chekiang that are not fit for agriculture, cover six to seven-tenths of the entire provincial area. These non-agricultural lands are treeless and often bare of vegetation of any kind.

"People living in these regions are poor and have suffered fearfully through non-use of these mountain lands. Idle lands are a detriment to society. The people are not only paying high prices for wood on account of wood-shortage, but also frequently experience destructive floods, winds, insects, etc., which could be stopped if these lands were properly utilized.

"I have tried to find out the causes for such a state of things and come to the conclusion that lack of forest is the principal cause.

"The benefits of forests are many, but I shall mention only the following:

1. Forestry, as compared with agriculture, requires very little labor.
2. Thinnings and intermediate cuttings can be used for fuel.
3. Many valuable fruits are from forest trees.
4. Matured trees furnish good timber for construction.
5. Forests prevent drought and afford best cover to soil.
6. Forests check, or at least lessen, the severity of floods, through absorption.
7. Forests stop soil erosion and consequent silting up of streams.
8. Timbered lands can often be used for grazing purposes.

"For these and other reasons, I hereby ask you to help promote forestry through the province. Consultations with leading men and gentry in your *hsien*[1] will be necessary. In your *hsien* select three or four areas for planting, each to be about fifty (50) *mow*. For buying seedling stock and preparation of land for planting spend about $200.00. If the areas selected be on private lands, ask the owners to help do the planting, and in case they refuse, proceed and plant anyhow. Nobody shall in any way prevent. After the different areas have been planted, it will be necessary for the local police to protect them from fire and thieves.

"When all this is done, a detailed report will be in order. Organize the local people and induce them to undertake private planting. Determine also the area to be planted in future for your *hsien*.

"I shall detail a man to make visits ere long, to see if all the *hsiens* are following out the instructions as given here. Due punishments will be given for neglect and delay."

Such a well-thought-out proclamation is significant, and the Governor is certainly setting a high standard. It is hoped that other provinces will follow suit, to make China, which has been called "the horrible example of forest neglect," a land in which to live happy, healthy and useful lives.

[1]Hsien means a district.

FAREWELL, OLD TREE

By Paulina Brandreth

Fair standest thou, O pine of royal girth,
  Amid thy virgin host. Straight as a mast
Thy fluted column towers from the earth,
  And calm thy rugged trunk doth meet the blast,
  And wide thy fronds of evergreen are cast
Upon the living air. A perfect whole
  Thy figure doth commemorate the past.
Unmindful of the years that onward roll
Thy steadfast beauty touches heart and soul.

Alas! we see thee fallen. Wrecked and shorn
  Like Samson of his strength, thou liest low;
Thy mighty limbs of bygone ages born
  Are stretched upon the moss in silent woe.
  No longer will thy head be crowned with snow,
Nor will our eyes aspiring behold
  Thy silhouette where sunset currents flow.
Farewell, old tree, farewell! Thus art thou sold
In all thy splendor for a pot of gold!

MT. KATAHDIN FORESTRY RESERVE

A CORRESPONDENT from Bangor, Me., writes: At the annual meeting of the Maine Sportsmen's Fish and Game Association, just held in Portland, the members of the organization went on record as very enthusiastically in favor of a National Forest Reserve in the Mt. Katahdin section, a bill for which is now before Congress. The scenic beauties of this section are well known and there is much valuable timber land as well as a great deal of game. Much of the land in this section is owned by the Great Northern Paper Company and there has been considerable speculation if the National Forestry Reserve should be formed in this region if it would include the famous Ripogenus Gorge, one of the scenic beauty spots of Maine. At Ripogenus the Great Northern is engaged in building a huge dam for the purpose of greatly increasing the water power, which has immense potentialities.

WHAT ABOUT YOUR TOWN LIBRARY?

DOES the library in *your town* take American Forestry?

Will you let the American Forestry Association know?

There are pages of information in it each month which are of particular value to the residents of *your town.* Information relating to trees which may save the residents worry, expense and loss.

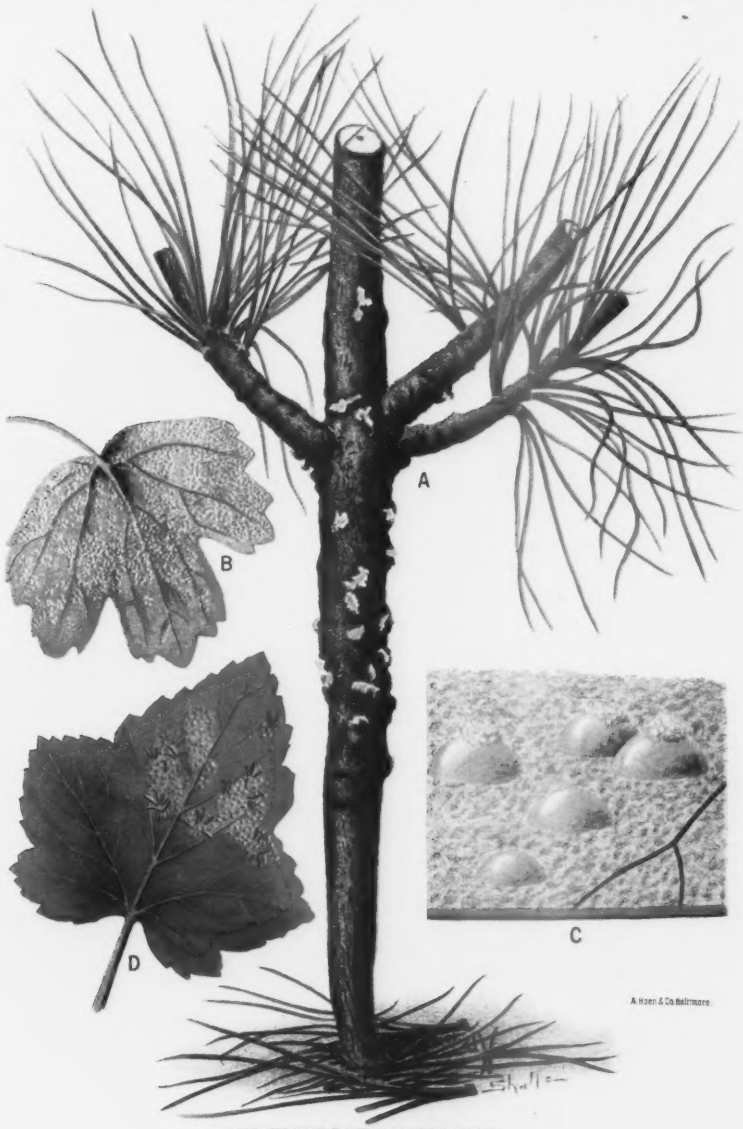
If the library kept American Forestry on file it would save *your town* much in the course of a year.

THE BLISTER RUST DISEASE OF WHITE PINE.

By Dr. PERLEY SPAULDING

PATHOLOGIST U. S. DEPARTMENT OF AGRICULTURE

[The White-pine Blister Rust which has been discovered in various sections of the New England States, New York State and in Ontario, Canada, threatens to do most serious damage to white pine and western sugar pine in the United States and Canada. There apparently is no way of overcoming it except to prevent shipments of pine seedlings from the infected sections, and by destroying infected pine trees, and currant and gooseberry bushes. This article and illustrations tell how to ascertain the presence of the disease, and what to do when found, and also sounds a warning against mistaking another for it.—Editor]



THE WHITE-PINE BLISTER RUST

Figure "A" shows a young white pine with open blisters and swollen bark.
Figure "B" shows a leaf of flowering currant bearing the early currant stage.
Figure "C" is a part of the same leaf much magnified and showing four of the spore masses.
Figure "D" shows a black currant leaf bearing the late filamentous stage, this being the stage in which it is transmitted to the pine trees.
"A," "B" and "D" natural size.

The White-pine Blister Rust is such a serious disease, and conditions are so favorable for its ultimate spread throughout the area inhabited by the white pine in this country, that the danger is very grave.

It is also known to attack the sugar pine of the Pacific Coast region; the western white pine of the northern Rocky Mountain region and the lumber pine of the Rocky Mountain region.

The U. S. Forest Service estimates the value of these pines at $411,000,000 divided as follows:

White pine—New England States, $75,000,000; Lake States, $96,000,000; Western States, $60,000,000; on National Forests, $30,000,000.

Western sugar pine—Western States, $105,000,000; on National Forests, $45,000,000.

Wild currants and gooseberries, which transmit the disease to the pines, are prevalent in the regions where these pines grow. While the disease is known to be present now only in the Northeastern States, it would be a matter of but a few years for it to reach some parts of the Pacific Coast or Rocky Mountain regions on pine nursery stock if shipment continues without restraint. The forest conditions there are such that if the disease once reaches the native forests there is no possibility of controlling it. This disease threatens not only the Northeastern States, but also the Pacific Coast and the Rocky Mountain regions.

While the situation in the Northeastern States, where the White-pine Blister Rust is now present, is critical and much worse to attempt to handle than it was in 1914 and previously, yet the nature of the disease is such that there is even now a fair chance to control it, if unanimity of action and adequate authority can be secured. The areas which are badly infected vary in size from only a few square yards up to one of hundreds of square miles. The only thing which will prevent any further spread of this disease in any one of these infected areas is the removal of all wild and cultivated currants and gooseberries, and of the diseased pines within those areas. Otherwise the disease will live in the pines as long as they remain alive and will be a constant source of danger to that neighborhood, as well as to the entire country.

WHAT SHOULD BE DONE.

Any person owning a plantation of white pines imported by himself or through a broker, or bought of a nurseryman without a definite guarantee that they were raised in this country from seed, may find this disease present. Although many American nurserymen in the past have raised most of the white pine stock distributed by them, it has been the rule rather than the exception for them to supply part of their trade with imported stock. A very large proportion of this imported stock has been shown by actual experience to be infected.

If an owner believes he has found any symptoms whatever of this disease, his best course is to take specimens in generous quantity, and in order to insure a prompt reply, mail them to the writer at the Bureau of Plant Industry, Washington, D. C. A positive identification of the disease will be made, so far as that is possible, and advice given concerning further action.

It is inadvisable for any owner to attempt to handle the disease without expert advice. Experience with this disease is very necessary in order to determine the extent of the disease and the best method of handling it in each case. Pieces of pine branches of trees of course may be sent as they are cut from the tree. Diseased currant or gooseberry leaves should be laid flat between folds of newspaper or blotting paper and then mailed in the ordinary way. Any owner who believes he has the disease upon his property should remember that a diseased pine will remain diseased as long as it lives, and if no attempt is made to control the disease upon his property he will be the first to suffer from it and will also probably suffer the greatest damage.

DO NOT MISTAKE IT.

In the Eastern States a native parasite often occurs upon the leaves of wild currants and gooseberries which forms yellow spots upon the lower surface of the leaves. These spots are usually from an eighth to a fourth of an inch in diameter (much larger than the blister rust spots) and do not have the powdery appearance that characterizes the blister rust disease.

DESCRIPTION OF THE DISEASE.

This disease was not discovered on pines in this country until 1909. Then it appeared as shown on the accompanying color plate in figure "A." This is a full-sized drawing of a 4-year-old white-pine tree affected by the disease. The yellow spots with irregular white edges are the open blisters of the parasite breaking through the smooth bark of the young tree. The white edge is part of a very thin, rather tough, white membrane. This, at first, is completely closed and is somewhat rounded, much resembling a blister. After a few days the top of the blister breaks loose and falls off, leaving merely the ragged edges of the membrane projecting upright around the cavity in the bark. Upon the breaking of the blister, it is seen that the entire cavity within is filled with a mass of very fine, bright yellow powder (spores). This is the stage of development shown in the colored plate. Each grain of this powder acts as a seed in starting the disease in a new place. It will also be noted that there is a certain amount of irregular swelling of the stem and branches shown in this figure.

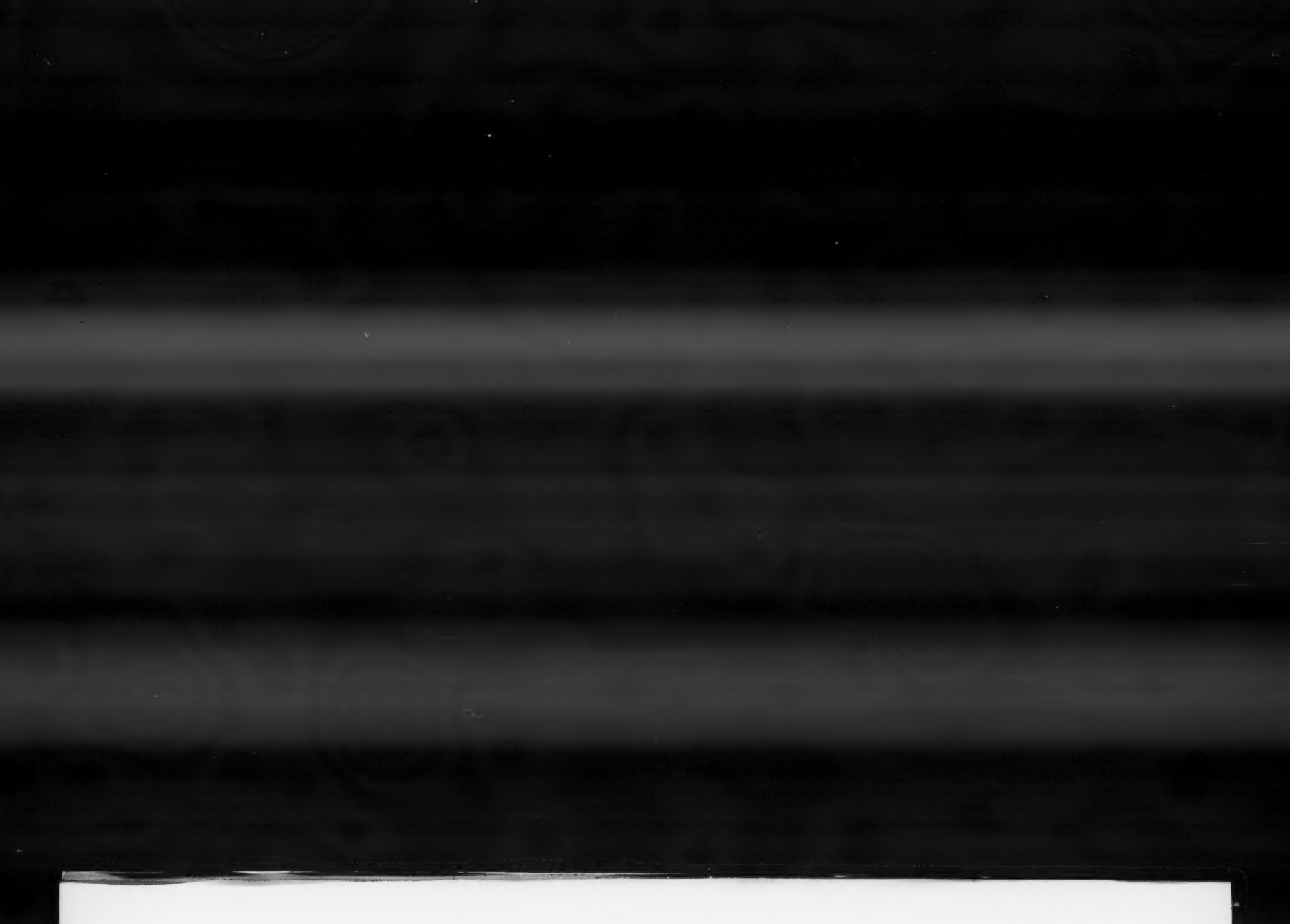
Such swelling is very characteristic of this disease. Before the blisters have formed in the bark, the young tree may show this same irregular swelling, but with absolutely no external break in the bark tissues. These blisters are found from the latter part of April to about the middle of June, depending somewhat on the earliness of the season and the locality. Very curiously, the parasite causing this disease cannot spread directly from pine to pine, but must live for a time upon the leaves of wild and the cultivated currants or gooseberries. The yellow spores from the pine infect the leaves of currants or gooseberries, and after about two weeks produce numerous tiny masses of orange-colored, mealy powder on the under surface of the leaves. These masses are hardly larger than the head of a pin and may be very scattered or may be so abundant as to form an almost continuous dusty layer, from which clouds of yellowish powder float when the leaf is disturbed. This yellow powder is a second form of spore, which in turn is able to infect more currant or gooseberry leaves.

This stage of the disease occurs from June 15 until killing frost, when the leaves of the currants fall.

Figure "B" shows a flowering currant leaf affected with this stage of the disease.

Figure "C" shows a portion of this leaf much magnified. The infection of new currant leaves at this stage may be repeated and a considerable number of generations of this stage of the disease developed during the season. Upon the beginning of cooler weather, however, there is produced upon the lower surface of currant and gooseberry leaves a third form of spore. These occur in the form of small groups of hairy outgrowths, each of which may contain from two to ten or a dozen filaments hardly one-fourth inch high, usually arranged in small circles.

Figure "D" shows this stage. Upon these filaments are produced numerous tiny spores. These cannot attack the leaves of currants or gooseberries but are able to attack the young bark of white pines. All of these three forms of spores are mainly distributed by the wind. The last-mentioned form of spore is found from the latter part of July until the leaves fall, and infection of the pines occurs immediately. When one of these spores alights upon the bark of a young pine, it begins to grow as does a seed, and pushes its roots into the living bark tissues. After once gaining entry to the soft bark it grows rather slowly and there ensues a "period of incubation" during which nobody can say whether the tree is diseased or not. This period varies from somewhat less than a year up to six years or more before a visible development of the disease can be detected. At the end of this incubation period more or less swelling usually develops in the bark at the affected point, and is later succeeded by the formation of the blisters.



Nut Growing, a New American Industry

By William C. Deming

MOST people who live in cities come to think, if they think about it at all, that the city is the whole thing. The country is well enough for a couple of weeks' vacation in the summer, or as a source of milk and country sausage, but the city with its hurry and bustle and vast business interests is the really important thing on which all else depends. Nothing of the kind. If the cities were all destroyed and the inhabitants distributed among the farms everybody would get along pretty comfortably. But if the farms were destroyed the great cities of the world would perish in a few days. The farms furnish the food for the cities.

The cities are growing faster than the farms. How are we going to feed the great city populations of the future? Is it to be on the present hand-to-mouth system of agriculture, with annual crops sown in the spring and reaped in the fall—if the weather is good? A bonanza king if it rains just right, a near-bankrupt if the weather and bugs are bad? Or are we going to develop a more stable and permanent system of agriculture in which tree crops shall have a prominent place?

A tree is a permanent thing. It lasts for years or hundreds of years. It doesn't have to be sown or planted every year, and hoed and cared for like a grain crop or potatoes or beans. Once its great roots go down into the earth it is pretty nearly independent of flood and drought. Pigs and sheep and cattle can graze under its shade and do it good rather than harm. And if your tree is a "great engine of production," an oak, chestnut, walnut, hickory, fig, pawpaw, persimmon, mulberry, carob or honey locust, the dropping therefrom will fatten the animals without labor by man.

Nine-tenths of our crops go to nourish our domestic animals and much of our work is waiting on them. If we can manage so that the animals will wait on themselves, and there is nothing that agrees with them better, we shall have more time to play with the children.

Of all the tree crops nuts are the most important because they are the richest natural food substance known. A nut is a seed, the result of Nature's supreme effort to pack as much nourishment as she can into the smallest possible space for the nourishment of the future young plant. Compared with the concentrated richness of the nut the red-cheeked juicy pulp of the apple or peach is but a sip of sweetened water, very pleasant to the taste and important in the dietary but of little value as food.

THE BEAUTIFUL SIGHT OF AN ALMOND ORCHARD IN BLOOM

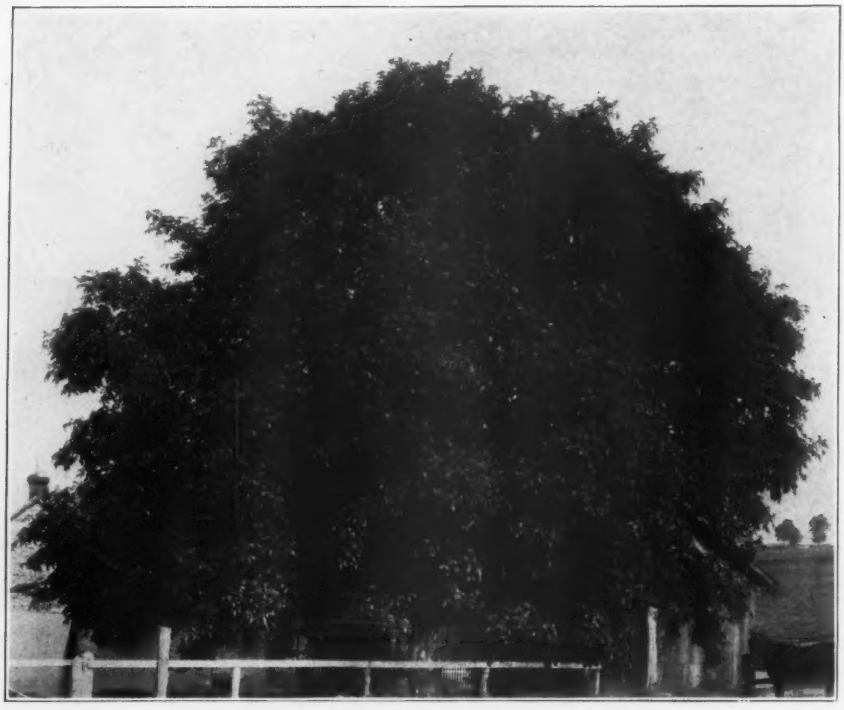
The almond industry is steadily growing in this country, and is a profitable one. The blooming orchards are worth going miles to see.

NUTS AS FOOD

Many nuts, on the other hand, contain as much muscle-building food as rich cheese, a third more than beefsteak, twice as much fat as cheese, five times as much as beefsteak and seven times as much as eggs. Chestnuts contain 70 per cent of starch, nearly as much as the best wheat flour and four times as much as potatoes. Peanuts and hickory nuts are three times as nourishing as beefsteak. When you think of it that way it hardly seems to be the thing to munch casually triple extract of beefsteak from a street nut stand or after a hearty dinner.

The bad reputation for digestibility that nuts have is due to such things. Eaten at the right time, in the right amount and properly chewed they are as digestible as any food of equal richness.

A fifty-pound bushel of black walnuts costing one



A GREAT ENGINE OF PRODUCTION

A Pennsylvania English walnut tree, which not only admirably shades the building and the road, but furnishes a large annual crop, and at the same time is very valuable timber.

dollar yields 12½ pounds of meats whose fuel, or food, value is 37,500 calories. The same number of calories in beefsteak at twenty-five cents a pound would cost over nine dollars. The buyer must crack the nuts and take out the meats himself, or have the children do it.

Butternuts are equally cheap and nourishing, but the proportion of meat to shell is less. The flavor, however, is more agreeable to most people.

Chestnuts, the large imported kind, when bought in quantity, are a fairly cheap source of starch, but not as cheap as wheat flour.

A bushel of hickory nuts at three dollars yields as many calories as sixteen dollars' worth of round steak.

Is not the nut being neglected as a source of cheap food?

Nuts are sanitary when not deprived of their protective covering. They take the place of meat without its possibilities of disease or poisoning. But make this exception, that nut *meats* passed through unknown hands have lost Nature's sanitary insurance.

TREE CROPS IN THE WORLD

This country is still but a healthy growing boy going to school to learn how to manage himself when he is grown up; and, naturally, in nut growing, as in many other things, his teacher is the grown-up old world. Over there they learned, centuries ago, the value of the tree as a food crop producer, and trees furnish the chief food and support of many people. In Mediterranean countries the land is one-third or one-half covered with trees growing crops for man and his beasts—figs, olives, acorns, carobs, chestnuts, almonds, walnuts. A man there can go to sleep for six months, have typhoid fever or take a sabbatical year off without losing much on his crops.

In parts of Italy they make

A CUT-LEAF ENGLISH WALNUT

This tree is not only an ornament, but is a worker, too. A fifty-pound bushel of walnuts, costing $1.00, is equal in calories to beefsteak costing $9.00.

their bread of chestnut flour. In Corsica they feed chestnuts to the horses. In Portugal the pigs are entirely fattened on acorns. Farms are valued according to the number of acorn oaks, chestnuts or walnuts. The chief income of many farmers is from walnuts or chestnuts, filberts or almonds, millions of dollars worth of which are exported to us, when we ought to be growing them ourselves.

A TYPICAL ENGLISH WALNUT ORCHARD

This is the Vrooman Franquetta orchard, in Southern California. Great care and skilled attention is given such large orchards as these, and there are many of them in Southern California. They produce a very substantial annual profit for the owner.

IMPORTS OF NUTS

Our annual imports are $15,000,000 in nuts and nut products, in normal times, with an average yearly increase of about a million dollars.

NUT GROWING IN AMERICA

And yet this country is just as good as anybody's country for growing nuts. We have such a diversity of climate that we can grow most of the world's varieties here in America, though it will take us many years to develop over the whole country the permanent system of agriculture, furnished by nuts and other tree crops, which has been built up through centuries in many older countries.

In some parts of this country, however, a splendid beginning has already been made. The walnuts and almonds of California bring even higher prices than the imported but do not nearly fill our needs. The new pecan grown in our southern states is a wonderful thing. Most people's idea of a "pea can" is a little red nut that lurks in the bottom of the Christmas bowl when all the good nuts have been picked out; a nuisance of a nut that cracks all to pieces and has to be eaten with a hairpin. These are the common wild Texas pecans worth four or five cents a pound that the dealer mixes in to increase the profits of the mixture that he sells for twenty-five cents a pound.

But there is no better nut in the world than the kind of pecan to which thousands of acres are now being planted in the South and which most people in the North have never even seen.

ORIGIN OF NUT VARIETIES

And how were these splendid nuts obtained? Not by some plant wizard mysteriously evolving them by scientific processes, but simply by putting grafts from the best nut trees of the fields and forests into young trees in the nursery. This does not change the nuts at all. It simply perpetuates them as Nature created them. Each grafted nursery tree bears the same nut that the parent tree bore.

Many people do not know that the only way we can grow any particular kind of fruit that we want is to graft buds from the original tree on other trees of similar kind in the orchard or nursery. All fruit trees that grow from seeds are new kinds. You can't grow a true Baldwin or Greening apple from seed. You must take the buds from a Baldwin or Greening tree and bud or graft them on another apple tree in orchard or nursery in order to get trees that will bear Baldwin or Greening apples. It is the same way with nut trees. You've got to bud or graft them to get the same nut that grows on the parent tree.

A man planted a thousand nuts from one genius pecan tree. Of the resulting trees no two bore nuts alike nor like those of the parent tree and none as good. This is because Nature isn't interested in growing things as man wants them. What she is after is seed and plenty of it. All trees grown from seed tend to revert to the common type that Nature has found most useful for her seed purposes. A genius tree, like a genius man, is a rare accident, and the children of geniuses are rarely geniuses.

We can't graft a human genius. If we could we might now have whole cities of Shakespeares, just as we have whole orchards of Baldwin apples. But we can graft genius trees and keep the characteristics practically unchanged, perhaps for centuries. So if you know of a genius nut tree it is your privilege and duty to have it perpetuated by grafting.

In the Old World, in California and in the pecan coun-

ENGLISH WALNUTS AS STREET TREES

Why, asks the author of this article, do people plant poplars, maples, willows, etc., as shade trees, when they could plant pecan, English walnut, hickory, chestnut, or black walnut for the same purpose, and at the same time get valuable crops from them?

try, they have passed through, or over, the seedling stage. All the trees they now set are grafted. But in the North some of our nurserymen are still in the seedling stage. Some of them must have cut their eye teeth, however, because they know enough to represent their seedling trees as grafted. But it is only the purchaser that is grafted. There is now no excuse for selling or setting seedling nut trees in the North any more than seedling apples or peaches.

A very large proportion of our native nut trees bear poor nuts. It is the exceptional tree that bears good crops every year of large nuts of good quality. These good nut trees are being lost from natural causes, or by the axe, every year and are not being replaced. Once gone a good tree is lost forever unless grafted on another tree.

PRODUCTIVE VALUE OF NUT TREES

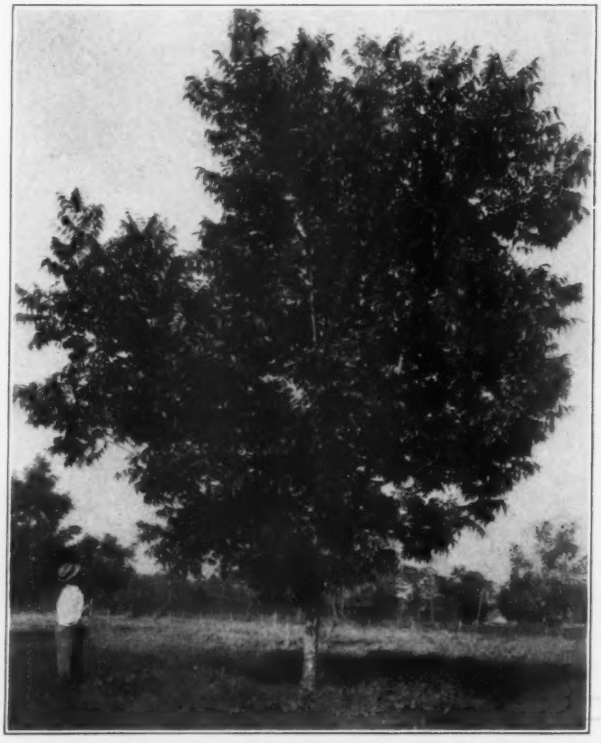
The productive value of some nut trees is immense. A woman told me in Indiana that she sold $90 worth of pecans at 15 cents a pound from one wild pecan tree. In 1910 Mr. John West of Monticello, Florida, sold 900 pounds of nuts from one seedling tree at 11 cents a pound and received a check of $99 for them. Another pecan tree averaged $90 a year for seven years in succession. A tree is Cairo, Ga., gave an annual average for three years of $100. One such tree on an acre would return more money and more food value than all the wheat that could possibly be grown on it, and with hardly any labor. And the wheat can be grown there, just the same, even with three such trees to the acre.

Nut growing is destined to be a great industry and to furnish a substantial part of the food supply of the world in the centuries to come.

Nut trees give us our best timber. The oak, beech, chestnut, hickory, butternut or white walnut, black walnut and Circassian or English walnut are among our most valuable woods.

Can anyone say why we do not use for shade trees, avenues and roadside planting, the pecan, hickory, black walnut, chestnut and English walnut? Why plant worthless poplars, soft maples, willows, ailanthus and other trees of little or no use except for shade, when we might have equally or more beautiful shade trees, combined with valuable productiveness? Suppose that our country roads were lined with fruit and nut trees and the products free to all? Would not that help solve the problem of food? A few bushels of nuts from your own dooryard trees, and a knowledge of how to use them in cooking, would lighten the burden of the bread and meat winner.

How could a man get more permanent fence posts, never needing renewal or painting, and paying him in fruit for the privilege of working for him, than with a row of nut trees?



A NEW PECAN, A SEVEN-YEAR-OLD BABY

The up-to-date pecan planter now uses only grafted trees, because it is not possible to get satisfactory results in trees grown from seed. There is now no more excuse for setting seedling nut trees than seedling apples or peaches.

Every farmer ought to have nut trees on his place just as he has fruit trees. He ought to have different kinds of nuts, just as he has different kinds of apples, pears, plums and peaches. Moreover, he ought not to be contented with wild nut trees any more than he is contented with wild apple or plum trees. He can now have

A WONDERFUL PRODUCER

A pecan tree in Indiana. It was such a tree as this which recently produced $90 worth of pecans at 15 cents a pound. Another averaged $90 a year for seven successive years, while a third gave an average of $100 for three years.

improved kinds of nuts of all varieties. He can begin by top working his native shagbarks and pignuts to choice shagbarks or pecans. His native black walnuts and butternuts can be changed into English walnut trees.

Everybody who has a place for a tree should set a grafted nut tree. Every owner of a village plot, or even of a city back yard, should have a nut tree. Never mind the ailanthus and poplar. Grow a tree that bears something to eat.

An infinite series of nut hybrids awaits the patient and long-lived experimenter. The best prophets predict the world almost living on wonderful new nuts five hundred years from now. Nature herself has already given us hints of the hybrid possibilities, though her chance results miss the mark that man's purposive efforts may be expected to attain.

Nut growing is only part of a new agriculture by which much of the food of man and his domestic animals shall be grown on trees, independent of many of the limiting conditions of sown crops, but permitting, under suitable conditions, companion cropping with sown or planted crops. It must be built on the idea of permanence and assurance. It must include the ideas of intensive cultivation, of two and three story agriculture, and of growing legumes. On our arable land we shall grow nut trees, three or four to the acre, giving them their greatest possible development; between them we shall grow peanuts, beans and alfalfa; we shall keep some chickens, pigs, sheep and a cow, and be forever independent of the meatman.

Of our steep, rocky and untillable slopes millions of acres will be clothed with oaks, chestnuts and beeches, with persimmons, pawpaws, mulberries, honey locusts and sugar maples, binding the soil and conserving rainfall; and beneath them our droves of pigs, flocks of

AN INFANT OF TWO YEARS

This young and ambitious chestnut, just two years from a graft, is going into business for itself at an early age. Note the burrs. Many grafted nut trees bear sooner than apples.

sheep and herds of deer will find shade and water while harvesting their own food.

It is foolish to say, "I am too old to plant trees." Some of our most enthusiastic nut planters are octogenarians or better. Grafted nut trees bear as early or earlier than other fruit trees. The man who plants fruit and nut trees takes out a paid-up life insurance policy for himself and his children. And the man who plants trees and cares for them himself will disappoint his anxious heirs and live long to enjoy the fruits of his own planting.

There is hardly a thinking man or woman to whom there does not sometimes come the old instinct and longing to get back to nature and the land. Youth seeks the competition of life with others in the city, but mature years bring the desire for the peaceful life of the country. "The boy on the farm dreams of the day when he can be the president of a bank, have a home in the city, own an automobile, smoke good cigars and go to the show every night. The bank president dreams of the day when he can turn again to the farm and walk in the green fields, where he can shun the various artificial activities of city life, drink buttermilk and retire with the chickens."

For him, or for anyone, there is no more peace-giving occupation than horticulture and no more fascinating branch of horticulture than nut growing. Let him use his leisure time, whether it be much or little, in learning to bud and graft nut trees, in growing seedling almonds in the search for a hardy, thin-shelled variety, in experimenting with the pine nuts, in breeding blight-immune chestnuts and filberts. The solution of any one of these problems will be of immense value to the country. And let him produce some of the infinite series of hybrid nuts that lie within the probabilities of the future. No man can have a better hobby, that universal need, than nut growing.

BIRCH TREE SPLITS GRANITE BOULDER

THE roots of plants and trees play an important part in converting rocks into soil. All rocks have seams or cracks or eventually develop them through the action of rain, frost and sunshine. Into these cracks, however minute, the rootlets of small plants penetrate, carrying with them a little humus to decay and to be followed by other roots. Moisture follows which freezes and cracks off small rock particles, when larger roots find their way in, carrying more dirt. Through the course of many years the crack widens and deepens and becomes filled with drifting dirt, when perhaps a tree seed blows into it, and then the real process of rock splitting begins. The expansive force of a tree root is tremendous, and if the rock has a well-developed seam it is likely to be riven entirely asunder. As the rock breaks and chips and disintegrates, it contributes to the vigor of the plant, since rock particles contain the elements of plant food. Some rocks are cracked by roots much more easily than others, yet even granite boulders are sometimes riven by tree roots where the rock has been seamed and weakened by various disintegrating agents. The photograph shows a granite boulder in Maine being slowly split by a birch tree.

THE WILLOW INDUSTRY

FROM investigations carried on by The New York State College of Forestry at Syracuse in the basket willow growing section about Liverpool and Lyons in New York State and in the study of reports of basket manufacturers, it finds that the bulk of the willow ware used in the United States is manufactured in the little town of Liverpool just north of Syracuse. The Liverpool shops use over 3,000 tons of basket willow stock which is 75 per cent of the total stock used in the country.

BIRCH SPLITS A BOULDER

Even Maine granite, hard as it is, cannot resist the expansive force of the roots of the birch shown in this picture.

About a year ago basket willow stock was bringing from $20 to $25 per ton delivered at the Liverpool factories. Today, owing to the cutting off of the foreign supply the prices average about $30 a ton, and that in spite of the increased local production.

7,300 ACRES WITHDRAWN

UPON the recommendation of Secretaries Lane and Houston, the President recently signed an order excluding 7,300 acres from the Pike National Forest, in Colorado. Of this amount about 6,000 acres are vacant public lands subject to settlement under the homestead laws in advance of entry or other forms of disposition. Such lands will be subject to settlement from 9 o'clock a. m. March 31st until and including April 27, 1916, and thereafter to disposition under any public land law applicable thereto. The lands are located in the central part of Colorado in Park County, and are within the Leadville land district. They are non-contiguous tracts in the foothills lying along the exterior boundaries of the southwestern part of the National Forest, and are non-agricultural grazing lands.

Wood Preserving Department

CREOSOTED WOOD BLOCK PAVEMENT

By O. P. M. Goss

STATISTICS show that since 1908 the increase in the use of creosoted wood block in the United States has been very rapid. For example, in 1908, 1,260,000 cubic feet are reported to have been laid, which amount was increased to a total of 10,000,000 cubic feet in 1911. Recent years have shown even greater increases, 1914 alone approximating 4,800,000 cubic feet of wood block pavement.

The reason for the increased use of this type of pavement is very evident. Engineers and investigators have been working to perfect wood block construction and have made good progress. This type of pavement must be used with a full knowledge of the material or the results will not be satisfactory. There is probably no material which requires more careful study than wood block in order to secure the very best results. On the other hand, this material may be inspected as to quality, etc., with a greater degree of certainty than practically any other material. Due to this certainty of inspection it is possible with efficient supervision to secure a first-class job in construction. In other words, any defects in the wood may be readily detected by a visual test-making inspection of the simplest type.

A CREOSOTED DOUGLAS FIR WOOD BLOCK PAVEMENT

This pavement in Seattle, Wash., shows but one-eighth inch wear after seven years' subjection to very heavy traffic. It is still in excellent condition, and wear has not occasioned one cent's worth of repair. Creosoted wood blocks are considered by experts to be the very highest type of pavement, giving maximum service and satisfaction at a minimum cost.

As a result of experience with creosoted wood block in the United States it has shown such excellent qualities as to encourage a more thorough study of the subject with a view to correcting any objectionable points. Engineers of many cities are examining its many qualifications and collecting evidence of the experiences of other cities with it, with a view to its use in their own town.

The durability of wood block pavement has been abundantly demonstrated. There are many instances where creosoted wood block pavement has been down for 6 to 13 years with no appreciable maintenance cost. The following are specific examples:

Jamestown, N. Y., pavement down 10 years. Maintenance reported, "Very trifling."

Toledo, Ohio, pavement down 12 years. Maintenance reported, "Very little, if any."

Minneapolis, Minn., pavement down 13 years. Maintenance reported, "None."

Hamilton, Ont., pavement down six years. Maintenance reported, "Not one cent."

New York, N. Y., pavement down eleven years. Maintenance reported, "Not a cent."

Boston, Mass., pavement down nine years. Maintenance reported, "Total cost, two-tenths of a cent per square yard."

Records such as these from cities having large amounts of creosoted wood block pavement are very significant.

As a result of records such as shown above, some of the largest and most progressive cities in the United States laid large amounts of creosoted wood block pavement in 1914, as follows:

City	*Sq. yds.*
Cambridge, Mass	29,037
Meridian, Conn.	44,331
New Haven, Conn.	81,944
Rochester, N. Y.	30,390
Newark, N. J.	73,151
Philadelphia, Pa.	31,224
Cincinnati, Ohio	44,015
Chicago, Ill.	139,914
Minneapolis, Minn.	204,655
St. Paul, Minn.	269,969
Kansas City, Mo.	16,783
Houston, Texas	73,275

26,400 square yards of pavement is equivalent to 1 mile on a 45-foot street.

One of the most important details is the treatment of the blocks. Douglas fir is unlike most woods from the standpoint of impregnation, and it has been necessary to develop treating methods especially for this wood in order to get the results desired. Paving blocks of any wood should be treated in such a way as not to cause any appreciable loss in strength. The steaming process is not suitable for treating Douglas fir blocks since the fiber of this wood is injured by this treatment. The following method has been developed for treating blocks and has proven thoroughly satisfactory:

The blocks shall be placed in the treating retort, direct from the saw, and the preservative introduced and heated to approximately 215 degrees F. for from one to four hours. The preservative shall then be drained off and a vacuum of 23 to 26 inches drawn to take out the surplus vapors, etc., from the wood cells. The vacuum shall then be broken by the introduction again of the preservative, which is then pressed into the wood at a temperature of 180 degrees F. until the blocks have received from 16 to 18 pounds per cubic foot. After receiving the required amount of oil, the pressure shall be released, and the temperature of the oil gradually raised to 220 to 230 degrees F., and held for one hour. This final heating expands the oil and vapors within the wood, and causes a certain amount of the preservative to be expelled, due to this expansion, and also effects further seasoning of the wood. A final vacuum of 23 to 26 inches shall then be drawn, which dries the blocks of the surplus surface oil, leaving a thoroughly impregnated block which will never "bleed" after being placed in the street, since it is forced to do its "bleeding" during its treatment.

The above treatment produces an ideal block, which retains its original strength and is amply fitted to resist swelling and decay.

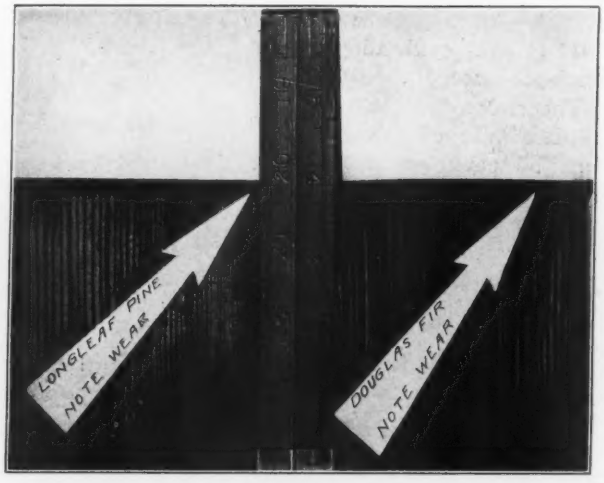
CONSTRUCTION DETAILS

In general, the following details of construction should give the best results in building a wood block pavement:

Blocks should be cut from sound, strong, close-grained lumber and accurately dressed. Variations in thickness and depth should not exceed 1/16 inch. They should be creosoted in accordance with the method above referred to, and 10 to 12 pounds of oil per cubic foot left in the wood. The blocks should be placed upon a smoothly finished concrete base, painted with pitch or asphalt immediately before blocks are laid. The painting should be thorough, and a bond secured between the paint coat and the concrete.

Blocks should be laid in courses at an angle of 60 to 67 degrees with the curb and with as close joints as possible. The *lower portion* of the joints should then be filled with very hot asphalt or pitch sufficiently fluxed to enable it to flow into the joints. The upper portion of the joints should be filled with hot, dry sand, and the entire surface rolled with a 10 to 14 ton roller to thoroughly seat the blocks and to finish completely filling the joints with sand. Liberal expansion joints should be provided along each curb. The lower half should be filled with bituminous filler and the upper half with clay. Fine gravel, one-quarter to half an inch in diameter, should then be scattered over the surface and rolled into the blocks until a surface satisfactory to the engineer is secured. A coat of fine sand should be spread over the surface of the pavement and left for thirty days after street is opened to traffic. Additional fine gravel coatings may, if desirable, be spread on the surface from time to time.

Douglas fir has thoroughly demonstrated its ability to withstand the wear found on business streets. Almost seven years ago a portion of Fourth Avenue, Seattle, was paved with creosoted Douglas fir blocks. This street is today in excellent condition, as shown by the accompanying photograph, and the city has had no maintenance



TWO WOOD PAVING BLOCKS

These blocks, one Douglas fir and the other Longleaf pine, are from Sections 7 and 8 of the Minneapolis Test Pavement and both have been under the same street conditions of heavy traffic for four years. The wear is practically the same on both woods.

to pay. The wear on the blocks has been approximately 1/16 inch, and more than 3,300 vehicles daily pass over this pavement.

Eleven years ago Douglas fir blocks were laid on Salmon Street, in Portland, Oregon. The city records indicate that the maintenance has been less than one-quarter cent per square yard per year. The wear on the blocks is practically nothing. The blocks were not properly treated.

There has been a great deal said regarding the value of Douglas fir as a paving wood. Examples, as shown above, indicate the ability of this wood to resist mechanical wear.

Four years ago Sections 7 and 8 of the Minneapolis test pavement on Nicollet Avenue were laid with Douglas fir and Longleaf pine blocks. This pavement is subjected to very heavy traffic and both sections are at the present time in first-class condition. There is no indication from the condition of the pavement that two woods were used.

C. S. JUDD HONORED

Forester C. S. Judd has recently been appointed by Governor Pinkham, of Hawaii, as chairman of the Conservation Commission of Hawaii.

Ornamental and Shade Trees

A Department for the Advice and Instruction of Members of the American Forestry Association

EDITED BY J. J. LEVISON, B.A., M.F.

ECONOMIC VALUE OF SHADE TREES

BY WILLIAM W. COLTON, B.S.

HOW are we to determine the value of our individual shade tree?

It is generally admitted that shade trees are valuable not only from an economic standpoint, but also from their aesthetic, historic and physical properties, but as my purpose is to show that there must be some definite method of determining their value, I am going to consider only the economic value.

The development of a street requires the removal of a tree at a certain point. Mr. A. says he wouldn't have that tree removed for $1,000. Would it damage his property to that extent? Would he pay that amount for replacing it? On what does he base his estimate of value?

A private corporation or individual damages a tree in such a manner that it dies. Mr. B. brings suit and claims damages of $500 or $1,000. The court allows him perhaps (?) $150.

A city or town has a row of trees killed by gas. The gas company is sued, and here again the court awards an arbitrary figure of perhaps $100 per tree, doubtless altogether regardless of size, species, or condition. What method is used in determining these valuations? Up to the present time there have been a number of methods used.

VALUE DEPRECIATED $230.91

This beautiful American elm would, if perfect, be worth $323.27, according to the calculations of City Forester W. W. Colton, but it has been so badly damaged by the ravages of the Leopard Moth that under the Deduction Factor System its value is only $92.36.

First, the arbitrary method; as for instance, in Massachusetts, where a State law formerly gave the court the privilege of placing a fine of not less than $5, nor more than $150, on a person found guilty of destroying a tree. This left it optional with the judge as to how much it should be. In New York State the court has established a record by handing down a verdict of $500 apiece for the destruction of a row of trees by a construction company. In some cases an arbitrary value has been placed on the tree by means of its diameter, as for instance, $2.00 per inch; that is, a tree 18 inches in diameter would be worth $36.00.

Second, the replacement value, under which would come such cases as are settled on a basis of the cost of replacement.

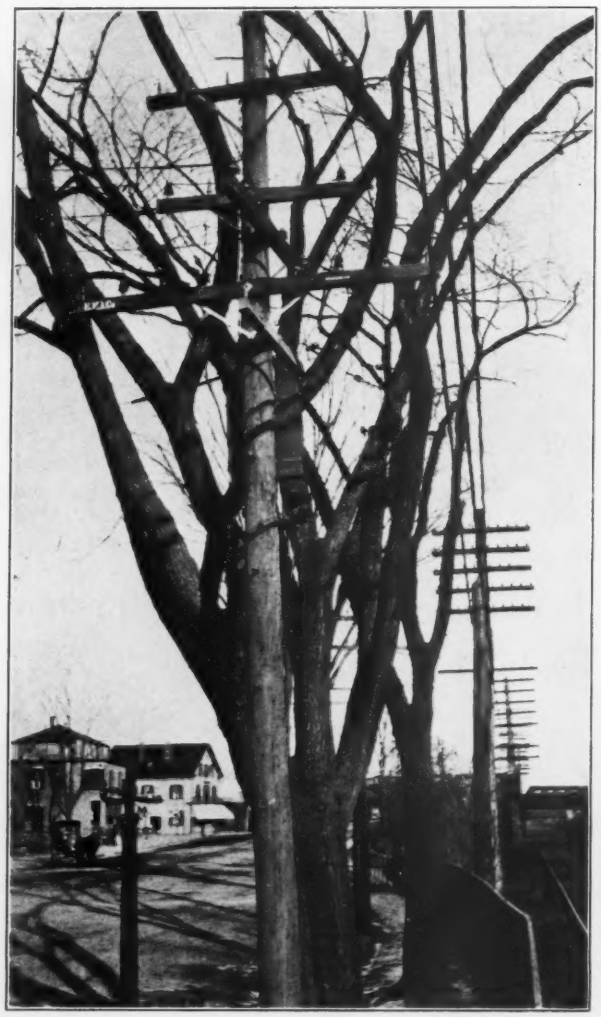
Third, is the method of placing an arbitrary value per square inch of basal area taken at breast height, or 4½ feet from the ground. The usual figure used in this case is $1.00. This is used principally because it is easy to figure with. In this case a tree 18 inches in diameter having a basal area of 254.47 square inches, would be considered worth $254.47. This is rather different from the first example and obviously quite as much too large, for an average case, as the first is too small.

The fourth, called Parker's method, is a variation of the above. In this case $1.00 per square inch of basal area is allowed, but a reduction is made for position, species, truck condition, top condition, and general desirability, scenic value, etc. Twenty per cent is allowed for each of five heads when perfect. An optional reduction is made for defects and the resultant figures added together and multiplied into the basal area valuation. This is by far the best of any system that has yet been advocated. It, however, has certain defects, as it tends to give too high a value to certain species.

For a number of years I have given much attention

to a study of the valuation of trees and am convinced that some standard of valuation should be adopted.

In analyzing the various methods now in use it seems that the most accurate way of estimating the value of a tree is by means of its basal area, as this is the best graphic indication of the tree's size of crown, which, after all, is the real valuable part of the shade tree.



DAMAGED ELM, VALUE $142.55

If this was not injured by the high tension electric wires it would be worth, so City Forester W. W. Colton estimates, $199.56.

No accurate basal area factor can be derived that will be equally valuable for all species. It becomes apparent then that we must first obtain a value per square inch for basal area that has some definite foundation, and then arrange a sliding scale of deduction factors for various species, according to their specie value, that is, rate of growth and resistance to insects, disease, climate and present physical condition.

To obtain the first, the sugar maple was selected as a standard species, because it has been more commonly planted for the past fifty years than any other tree, and we have more available data in regard to it. In order to reach a definite figure to apply to the basal area, we based our calculations on the amount of money invested in growing a tree to a diameter that would produce that basal area. This includes the original cost of the tree, its planting and maintenance. By using the best available figures for a sugar maple, we found that the average value per square inch of basal area at the end of fifty years is 64½ cents. This is the value for an ideal tree under perfect conditions.

The next step was to obtain a scale of reduction factors for species and condition. It is evident that by the use of this method the value placed on a 12-inch fast growing tree would be the same as on a 12-inch slow growing tree, whereas the actual value of the slow grown tree would be much more. For instance, from a standpoint of interest

IMPERFECT ELM, VALUE $51.96

The high tension electric wire passing through the branches of this tree has seriously impaired its value and will still further injure it. If it was in perfect condition it would be worth $181.54.

on investment and maintenance, a 12-inch beech would be worth very much more than a 12-inch poplar.

To obtain a deduction factor, the most common species were divided into five classes, according to their rate of growth, and a proportional deduction made for each class.

As all trees are not equally valuable on account of their susceptibility to insects and diseases, they were again divided into five classes and the same deductions made.

One more reduction factor was necessary to complete the list, that for the present physical condition of the

tree. To obtain this a reduction was made for the condition of the top and trunk, and the resulting figure used as the factor.

By applying the factors, obtained from the above deductions, to all common species of shade trees, we found that the sugar maple was 15 per cent below a perfect tree. Therefore, if the value of a sugar maple was 64½ cents per square inch of cross-section, the value of a perfect tree, or a standard value, would be 75 cents.

A table has been prepared, using 75 cents as the value per square inch of basal area for a perfect tree, and showing the proper deduction factors for all species of shade trees. This table is being used by this office in obtaining values, and has been found very satisfactory.

There is one point in the discussion of the value of a shade tree which has not been touched upon in this article, and that is "location." Viewed from some angles, this is a very important point. From the fact, however, that there is such a chance for diversity of opinion as to the proper and improper location of a shade tree, I have purposely neglected to take this into consideration in my factors for deductions. The opportunities for deductions of all kinds are so great, and the possibility of arriving at any definite figure for abatement so uncertain, that it has seemed best to eliminate this factor entirely. It is my belief that this deduction can safely be neglected, unless the tree is most obviously out of its proper location. If, as stated above, there can be no question about its improper location, then the party or parties judging the value should make some arbitrary reduction from the value placed on the tree by the prepared tables.

As a concrete example of the usefulness of some set value for shade trees, we have established an approximate value for all the street trees of Newton, Massachusetts.

In the summary of data gathered from the shade tree census, we have grouped all our trees by species, diameter classes and conditions. For instance: Sugar maple, $^1/_6$-inch; $^7/_{12}$-inch, etc., and either Good, Fair or Poor condition.

Species.	*No. of trees.*	*Value.*
Sugar Maple	6,531	$612,851.00
American Elm	2,471	417,867.00
Norway Maple	1,130	98,737.00
White Ash	382	85,112.00
Red Maple	480	72,324.00
White Maple	355	40,206.00
All other species	1,228	189,505.00
Total valuation	12,577	$1,516,602.00

NORWAY MAPLE WORTH $63.61

A perfect specimen twelve inches in diameter, the value of which has been calculated upon the basis described by City Forester W. W. Colton.

To obtain an approximate value for these, we have eliminated those classed as Poor altogether, and then based our calculations on an average valuation for trees in each diameter class. The average value was then reduced for species and the resulting value applied to the number of Good and Fair trees of each species in each diameter class, with the above result.

This is discounting entirely 2,320 trees classed as Poor, which would, of course, have some value.

It can readily be seen that with a permanent value established, the above figures are of unmistakable assistance to a City Forester or Arborist in convincing the City Government or Town Fathers that it is a good investment for them to appropriate a sufficient sum of money to properly care for these trees.

AN EXHIBIT OF TREES

An exhibit of ornamental and shade tree work in public parks and on private estates will be held under the auspices of the Conservation Department of the General Federation of Women's Clubs, on May 24th, at the Seventh Regiment Armory, New York City. The Ornamental and Shade Tree Department of American Forestry has been appealed to for its cooperation, and is now organizing a general campaign of cooperation, enlisting shade and park commissions, city foresters and others willing to cooperate. All communications for further details may be sent to the Editor of AMERICAN FORESTRY, or to Miss Mira L. Dock, chairman of the Forestry Committee of the General Federation of Women's Clubs, Fayetteville, Pennsylvania. Promises for good exhibits

have already come in, and those interested should write at once. The American Academy of Arborists, at its last meeting in Newark, expressed its interest in the exhibit, and many of its members have already started to work on it.

AMERICAN ACADEMY OF ARBORISTS MEET

The first annual convention of the American Academy of Arborists was held on January 28th, at the City Hall in Newark, N. J. It was a successful meeting, attended by most of the representative arborists of the country. The discussions of the members proved beyond doubt that the work of the trained and experienced arborists is a highly professional work, and that the Academy is determined to place the profession on the highest possible basis.

The city of Newark had much to show in arboricultural work, and the Mayor, the Shade Tree Commissioners, and the Board of Tree Commissioners showed what Newark could do as a host. Those who gave special lectures were Messrs. Carl Bannwart, Secretary of the Newark Shade Tree Commission, on "The Ministry of Trees;" Hermann W. Merkel, Chief Forester, New York Zoological Park, on "The Tree Fakir;" J. J. Levison, of the Brooklyn Park Department, on "Arboriculture as a Profession," and R. Brooke Maxwell, City Forester of Baltimore, Maryland, on "Fungus Problems of Interest to Arborists." The old officers were re-elected, with Hermann W. Merkel, Zoological Park, New York City, as President, and J. L. Levison, Brooklyn Park Department, as Secretary. The Academy had to refuse membership to quite a number of candidates, but elected the following eight Fellows and one honorary member:

George H. Hollister, Assistant Superintendent of Parks, Park Department, Hartford, Conn.; Dr. George Stone, Amherst University, Amherst, Mass.; Ernest F. Braunton, City Forester, Los Angeles, Cal.; William J. Coleman, Forester, Shade Tree Commission, Newark, N. J.; Albert R. Robson, Forester, Bronx Parkway Commission, Pennsylvania Avenue, Chestwood, N. Y.; Allan Oakley Smith, City Forester, 70 Valentine Street, Mt. Vernon, N. Y.; John A. Anderson, Forester and Secretary, Shade Tree Commission, Montclair, N. J.; Harry J. Mueller, City Forester, Harrisburg, Pa. Honorary member, Carl Bannwart, Secretary, Shade Tree Commission, Newark, N. J.

"AMERICAN FORESTRY" THE OFFICIAL ORGAN

The American Academy of Arborists, at its recent meeting in Newark, N. J., chose AMERICAN FORESTRY as its official medium for expressing its sentiments and experiences in behalf of arboriculture. There is no doubt but that what the American Academy of Arborists, collectively or individually, will say, will be worth saying, and with absolute confidence in the professional standing of its members, AMERICAN FORESTRY feels highly honored and pleased to open its pages in cooperation for the uplift of professional arboriculture.

ADVICE FOR FEBRUARY

1. Remove and burn all hopelessly infested trees.
2. Clean up the heavy brush in the woodlands and burn while the snow is on the ground.
3. Thoroughly dig out all decayed wounds and cover the surface with coal tar.
4. Collect and burn the egg masses of the white marked Tussock moth and destroy eggs and cocoons of other insect pests.
5. Prune fruit trees, removing all dead wood and heading in the tops, so as to form low heads.
6. Spray fruit trees for sucking insects and canker. Determine beforehand what you are spraying for and then use chemicals and methods in accordance with the particular pest you are spraying for. Choose a fine, mild day for this work.
7. Inspect all pear trees for fire blight and cut out and tar all cankers from main branches and trunk.
8. Cut out black knot from plum and cherry trees.
9. Prune and tie up grape vines.
10. Cover with coal tar all old wounds and scars on trees.

QUESTIONS AND ANSWERS

Q. What can be done to protect the hickory trees now dying in great numbers in the vicinity of Baltimore? I have several around my house and two died last summer. Is it true that their death is due to a small insect which invades the bark and girdles the tree? J. H., *Baltimore, Maryland.*

A. It is true that death of large numbers of hickory trees in this vicinity is due to a small beetle which invades the inner bark and girdles the tree. The remedy consists in locating the infested wood and removing and burning it before May, the time the mature beetles emerge. On page 797 of the July issue of AMERICAN FORESTRY you will find an article describing this insect and how to eradicate it.

Q. Am sending specimen dead cuttings of mountain ash and would appreciate your advice and information. The tree is about six to eight inches in diameter, 25 feet tall, has not borne any fruit last season and very little the year before. The bark shows discolorations and both large and small branches are dying off. Could the trouble have originated because a few scars had not been painted over where a few branches were removed? Is mountain ash a very hardy tree in this latitude? O. A. K., *Grand Rapids, Mich.*

A. From the specimens submitted it looks as if the round-headed apple borer or some other borer has attacked the tree. Please look for borers. I doubt whether the scars had anything to do with the trouble. The mountain ash is not a very hardy tree in the east, is often attacked by borers and scale insects and when it once starts going backward it is very difficult to save it.

Q. Shall appreciate your advice as to the best time and most desirable spray to use for the oyster scale. A very interesting case has arisen here and we are considering hiring a man to spray for this pest now, in January, but it is my personal belief that it is better to do this in the spring and that winter spraying is not so effective. W. W. M., *Rogers Park, Ill.*

A. The oyster-shell scale may be controlled by applications in the Spring, the middle part of May or later, of a contact insecticide such as kerosene emulsion or whale-oil-soap solution, making the application when the crawling young are most abundant. Systematic spraying with lime-sulphur wash, that is, annual applications, will help considerably to keep this pest under control, though for a serious outbreak you will do better by waiting until spring, as described above.

Q. How is it possible to protect beech trees from parasites that infect the leaves? They are found on the undersurface and cause the leaves to wrinkle and curl up and eventually to become yellow and die. J. H., *Baltimore, Md.*

A. You can readily destroy these soft-bodied sucking insects by spraying the under side of the leaves at the time the insects appear with a whale-oil-soap solution at the rate of one pound of whale-oil soap to 5 gallons of water.

ORNAMENTAL TREE WORK IN CHINA

Mr. Chang is a graduate of the Yale Forest School and has gone back to interest his people in the planting of parks and streets. He writes as follows:

"Some time ago your welcome letter with a separate parcel of pictures and literature came to me. Thank you very much for them. I have been reading AMERICAN FORESTRY and like your articles and advices very much, for they often give me just what I want.

"Our mission has two pieces of land, one 30 acres, where the college campus will be, and not far from the city, and the other 28 acres, more or less, on a hillside about four or five miles away from the city. The latitude here is about that of Florida, except inland. The soil is bottom land, with surface soil of fine loam and subsoil of clay. What kinds of trees are best as shade trees for the campus and as an experiment station for the other? At present both pieces are treeless. My suggestions are: To plant as many willows as possible for the time being, especially on the campus. To try to get some young trees of ginko, plane, locust, Uku tung (*aleurites cordata*) a very hardy and shady tree, for the immediate planting. To establish a small nursery on the property for replacing the willows and planting the rest.

"How do you treat the ginko seeds before sowing? The seed, or fruit, is a little smaller than an olive, with a hard, limy cover and meat within."

A. You certainly do have an excellent opportunity to bring this new phase of arboriculture and ornamental tree planting before your people, and we would be very anxious to cooperate with you from time to time and offer you all the suggestions we possibly can. Your idea of planting willows, etc., for immediate effect and interplanting trees of a more permanent character is a very good one. Your selection of species is all right except that I would like to suggest the addition of many more varieties both for the sake of experiment and for the sake of change of color and character. I am not familiar enough with your conditions to dare give you an absolute list of what you should plant, but it seems to me that several of the oaks, beeches, the pines, the hackberry, the birches, the tulip tree, sweet gum, magnolias, the elms, the catalpas, the native Wu tung, or Chinese National Tree. Would not recommend the aleurites, or wood oil tree for shade planting; and some of the smaller ornamental trees and shrubs should be represented. If you cannot use them all in your permanent plantations, I would suggest that you at least put them in a nursery for future use.

As to the treatment of the ginko seeds before sowing, I found the same difficulty that you have experienced, and obtained good results by filing the edges of the seed a little before putting them in the ground. That prepares the seed for easy breaking and germination.

MONUMENT TO A TREE

PERHAPS one of the most curious monuments in existence has recently been built in Ontario by Canadians, says *The Popular Science Monthly.* The farmers have just erected a marble pillar to mark the site on which grew a famous apple tree.

More than a century ago a settler in Canada named McIntosh, when clearing a space in which to make a home in the wilderness, discovered among a number of wild apple trees one which bore fruit so well that he cultivated it and named it McIntosh Red.

The apple became famous; seeds and cuttings were distributed to all parts of Canada, so that now the McIntosh Red flourishes wherever apples grow in the great Dominion. In 1896 the original tree from which the enormous family sprang was injured by fire, but it continued to bear fruit until five years ago. Then, after 15 years, it died, and the grateful farmers have raised a marble pillar in honor of the tree which did so much for the fruit-growing industry of their land.

The story of this apple tree illustrates the African proverb that, though you can count the apples on one tree, you can never count the trees in one apple.

FORESTRY ESSAY CONTEST

IN an effort to stimulate interest in forestry and in the conservation of forest resources, the Indiana State Board of Forestry has announced prizes, to be competed for by the school children of the State, for an essay on "A Plan for the Beautifying of the School Grounds by Planting Trees and Shrubs." The first prize will be $12.50 and the second, $7.50 in cash, to be given to the successful contestants in the high schools of the State, and prizes of the same amounts will also be awarded the grade and country school writers of the best essays.

Editorial

PUBLIC PLAYGROUNDS THREATENED

IN an editorial published in February, last year, we called attention to a peculiarly vicious bill introduced in the last session of Congress, whose purpose was to rob the people of the West of their title to, and free use of lake shores, camping sites and summer recreation spots, by permitting these lands to be acquired in perpetuity by private owners. Failing of passage at that time, this bill has now been reintroduced and is known as Senate Bill 1065, and House Bill 349, which are identical. The bill provides that any citizen over 20 years of age may file on public lands, whether or not they are part of a National Forest, and acquire absolute title within three years by merely spending a two months' summer vacation each year on the property and investing at least $300 in improvements. The area which one person can so acquire is ten acres.

The area of National Forests is some 160,000,000 acres. Throughout this great domain the acreage of lake and stream frontage suitable for summer camps is probably but a small fraction of one per cent. Water is the one indispensable accessory to the summer camp or home. These portions of the public playground are more valuable to the people for this purpose than all the remaining area put together. They are the jewels of the public domain.

Under this bill these choice spots could be rapidly filched from the public and "no trespass" signs would forever bar us and our children's children from the enjoyment of lake and stream, except through the medium of the "resort," acquired by the enterprising locator at points of vantage and developed to exploit the seekers for outdoor recreation.

But it may be asked: Have not all of us an equal chance to secure a choice bit of land of our own, and should not these public lands be given to those who can use them? This is the old doctrine of private appropriation appearing this time in bold defiance of the most widely accepted of all public policies—that parks are for the people at large and that private encroachment will not be permitted. As well say that the Yosemite and Yellowstone should be dealt out piecemeal to the most agile applicants as to permit this grab of the remaining public pleasure spots on the National Forests.

But there is this distinction—while the National Parks are kept wholly for the transient tourist and camper, the National Forests may legitimately be opened to the summer resident who wishes to live in a house of his own construction, and this can be done without parting with the title to land or interfering with the rights of the camper. By a law passed in 1915, leases of land for thirty years for this purpose are permitted on National Forests. The size of the area is determined by local factors. Wherever they are needed, areas are set aside solely for camping sites, and withheld from leasing. Under this law, in one locality 581 summer homes have been built on an area of 129 acres.

By contrast, under the proposed bill, thirteen persons could acquire the entire area and either expel or lease to the remaining 568 occupants. By the terms of this contemplated measure no one could acquire title to land who was unable to spend at least two months each year upon his homestead—and as there is no possibility of developing an agricultural living on such small areas, this would mean the practical exclusion of all but those of abundant means who can afford a vacation of this length. Furthermore, this law would sanction the acquisition of land anywhere on a National Forest, for any purpose whatever, whether it be for the establishment of undesirable resorts or the blocking of some point of outlet for timber, and no questions may be asked. Two months' residence each year for three years and a payment of $1.25 per acre secures title.

The sponsors of such legislation may be deceived as to its character and purpose, but the public is keenly alive to dangers threatening possessions so highly prized. The American Forestry Association hangs out the danger signal, and the inscription, equally legible to legislators and to land grabbers, reads "Hands off."

The Weeks Law Hearing

OFFICERS of the American Forestry Association, representatives of other forestry and conservation organizations, and delegates from most of the New England and Southern Appalachian States, appeared before the Agricultural Committee of the House at Washington, January 28, and for three hours presented arguments in favor of extending the appropriation for the purchase of forest lands for the protection of the headwaters of navigable streams under the provisions of the Weeks law. The committee was deeply interested, and each member asked a number of questions relative to work done under the Weeks law in the past five years, and the necessity for continuing the purchase.

The presentation of arguments was directed by Percival S. Ridsdale, executive secretary of the American Forestry Association, and Governor Locke Craig, of

South Carolina, presented the speakers and summed up the situation at the close of the hearing in an eloquent and forceful address in favor of the proposed measure.

There was submitted for the consideration of the committee an amendment to the Agricultural Appropriation bill, providing that two million dollars a year, for the next five years, shall be provided for the purpose of continuing the purchase of forest lands, and a sum, not exceeding $25,000, to pay the necessary expenses of the Forest Reservation Commission.

The arguments were presented by Henry S. Graves, chief forester of the United States; William L. Hall, in charge of the the Weeks law operation for the Forest Service; George Otis Smith, director of the Geological Survey; Senators John W. Weeks, of Massachusetts, after whom the original bill was named; Allen Hollis, representing the State of New Hampshire, the Society for the Protection of New Hampshire Forests; and the Connecticut Valley Water Ways Association; Hon. Harvey N. Shepard, of Massachusetts, representing the Appalachian Mountain Club; George S. Powell, of Asheville, N. C., representing the Appalachian Park Association; Harold M. Parker, chairman of the Massachusetts Forestry Commission, representing the State of Massachusetts and Governor McCall; I. C. Williams, deputy forestry commission of Pennsylvania, representing Governor Brumbaugh; John S. Ames, of Boston, representing the American Forestry Association; Frank M. West, of Springfield, Mass., representing the Western New England Chamber of Commerce, and W. O. Filley, of New Haven, Conn., representing the State.

There was a large attendance at the hearing, many members of the Senate and House, who had been requested by various State bodies to represent them, spending some time listening to the arguments; and a large number of delegates whom there was not time to formally hear, whose names and whose authorization to attend were later presented to the committee for its records.

Besides those mentioned there were present, among others, the following:

H. C. Bryant, New Haven, Conn.; Philip W. Ayres, Society for the Protection of New Hampshire Forests; Allen Chamberlain, Massachusetts Forestry Association and Society for the Protection of New Hampshire Forests; E. C. Hirst, State Forester of New Hampshire, representing the New Hampshire Forestry Commission and the New Hampshire State Board of Trade; W. H. Plummer, Director Asheville (N. C.) Board of Trade; Dr. Joseph Hyde Pratt, Chapel Hill, N. C.; A. E. Tate, High Point, N. C.; Fred Tate, High Point, N. C.; C. C. Smoot, North Wilkesboro, N. C.; H. E. Fries, Winston-Salem, N. C.; Julius C. Martin, Asheville (N. C.) Board of Trade; Mr. DeBlanc, Agricultural and Commercial Association, Riedsville, N. C.; J. W. Haynes, Buncombe County, N. C.; D. Hiden Ramsey, Asheville, N. C.; J. C. Smoot, North Carolina Forestry Association, North Wilkesboro, N. C.; W. M. Goodman, Knoxville, Tenn., Board of Commerce; Porter H. Dale, representing the Greater Vermont Association.

War's Effect on Trees

By F. McVickar

Mr. McVickar is a well-known Canadian forester, who enlisted with the Canadian contingent, was assigned to the cavalry arm of the service, and has been serving for some time in the British line in Northern France. He is not permitted to publicly announce the name of his troop nor the place it is located.—Editor.

I AM sending all I could scrape up about the effects of war on forests during the two months I was in France. In the army on service a man's time is never his own, and his movements are also very much restricted. Also when in the areas affected one is generally as close to mother earth as he can get during daylight hours; and consequently one's horizon is very circumscribed, especially in a very flat country.

"The sound of flying bullets and the burst of shells too tends to keep one's mind occupied with problems which at ordinary times are more interesting to woodchucks, badgers and the like than to foresters. However, now that everybody is talking of the war, and thinking of the war above all else, my little effort may not be entirely unwelcome.

"Unfortunately the country in which our force is operating is almost devoid of woodland. However, farther south in Alsace and Lorraine, there are extensive forests, but of course I couldn't get near them. Photos are absolutely out of the question. Cameras are not allowed out there to any except a few generals, etc.

"I have been in the trenches in Northern France; and although I didn't see enough of the effect of military operations on forest land to warrant venturing on anything like a technical discussion of the subject, a few of my impressions of this side of warfare may not be entirely amiss. First, I would like to say that while these operations are going on it is pretty nearly impossible to make any observations of value on this subject. This, I hope, will be made clear in the remarks which follow.

"The part of the line held by the British runs through a very low, flat country largely taken up by farming. It boasts of nothing but small patches of wood scattered about here and there.

"The operations that have taken place on this territory may be grouped under two heads; the first heading covering those operations incident to the advance toward Paris at the beginning of the war, and the second covering the almost stationary siege warfare of the present stage of the war.

"The damage caused by the first-class of operations is very slight in this part of the country. Chiefly because

the patches of wood are isolated and because owing to the general scarcity of wood litter and dead branches are kept cleaned up. Consequently the woods are not easily burned. Also at that stage of the struggle bodies of men moved largely along the roads, and artillery fire was not of long enough duration in one place to do much damage. Earthworks then were not very elaborate and poles were not used so much in their construction as at present.

"The effect of the operations coming under the second head are much more noticeable for the simple reason that the fighting has for many months been confined to a rather narrow strip of country.

"One might subdivide this area into two zones: the zone of constant bombardment, that is the zone of the trenches where there is an almost constant hail of shells and the zone of intermittent bombardment, this being the territory where the local range heavy guns drop a shell now and then, searching for the opposing artillery or sweeping the roads in search of transports or columns of troops.

"On the areas covered by the constant fire there are no living trees or even large shrubs left; in fact I've seen small patches where it seems that even the grass blades must be pretty well frayed out. Here, naturally in daytime, one keeps down in the trenches as much as possible, and in the dark one is too busy perfecting and repairing one's particular portion of trench to look around very much.

"However, by peeping out very cautiously in the daytime one may get an occasional glimpse of what used to be a patch of woods or a few isolated trees.

All species look pretty much the same now; a stub more or less split up, with one or more bits of broken branches still clinging on near the top. There are no leaves, twigs, or small branches remaining, and even most of the bark has been whipped off by flying metal.

"The earth is generally broken up and pitted very generously with shell craters. Now the explosion of a good many of these shells, for instance those containing lyddite, generates fumes which stain everything in the immediate vicinity; sand bags, clothes, and the very earth itself. As far as I could make out these fumes constantly settling on the soil will kill, or at any rate damage, its vegetation, and probably will reduce its fertility, for a time at least. However, when the war is over our French and Belgian friends will be able to tell us all about this.

"As to the effect of the gas on the soil, I have never been in the gassed country, so do not know much about it. They say that it kills the leaves on trees and shrubs.

"The long range bombardment of the second class doesn't do any appreciable damage to woodlands because the shells do not cover much of the ground and are generally dropped on other things than trees.

"A good many poles are taken from this area immediately behind the trenches for use in earthworks. This undoubtedly takes a good deal of material from the future yield of the stands. However, owing to the great size of the area they are removed from the removal is not very noticeable in any particular spot.

When the time of reconstruction comes there will be an increased demand for timber for a time. All buildings, although in Europe largely made of brick or stone, require some wood in their construction. Most of the buildings close to the scene of the present operations will have to be completely rebuilt. Wood goes into railway construction, and a great many public works; all of which have suffered very heavily wherever near the trenches.

"Hence we will not only have damaged forests on the areas affected, but also a need for timber which for some time will be much greater than before the war."

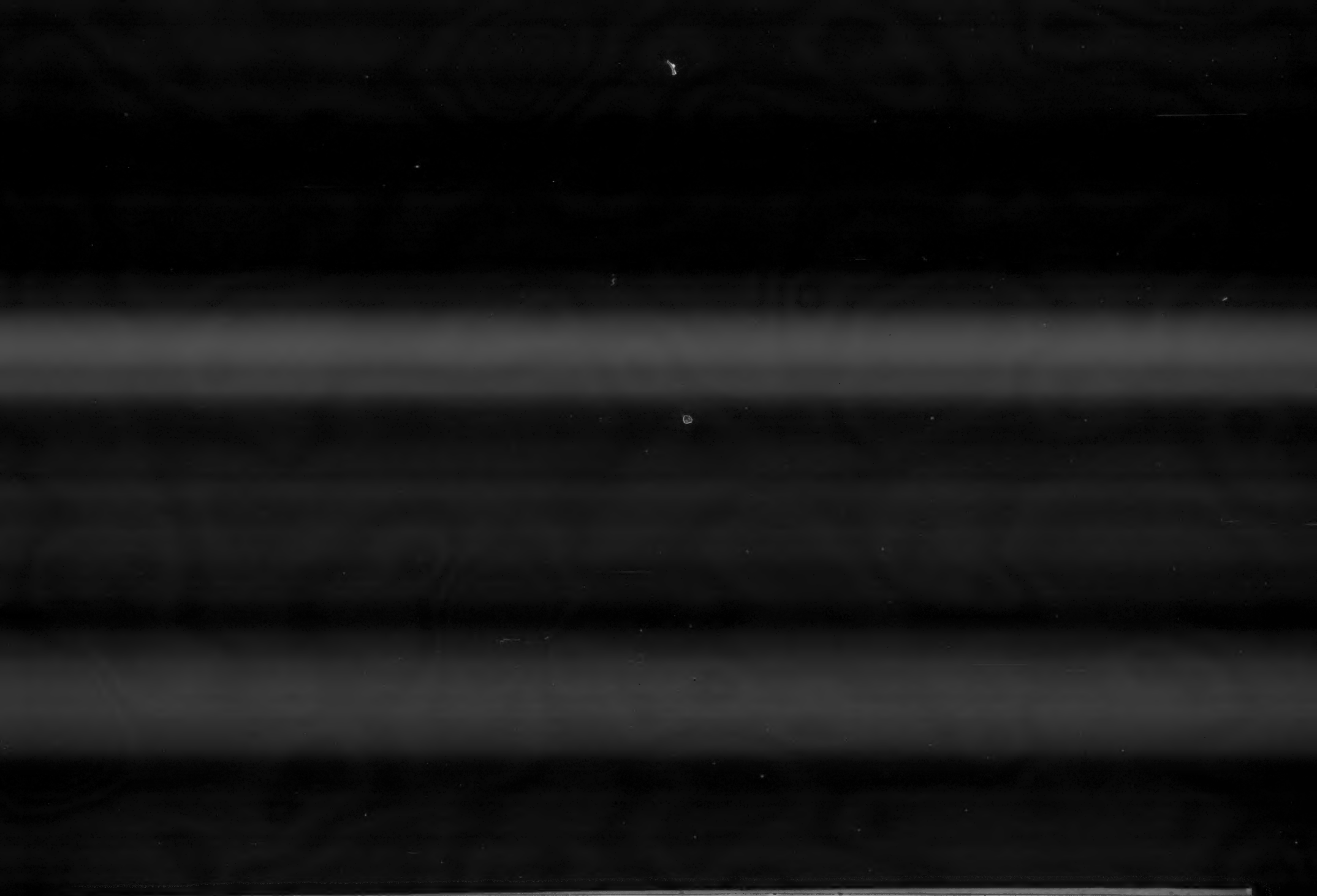
SOCIETY OF AMERICAN FORESTERS' MEETING

THE annual meeting of the Society of American Foresters was held in Washington, D. C., on January 22. In addition to the usual reports of the retiring officers and committees, several matters of special importance to the Society were thoroughly discussed at the two business sessions. Chief among these were the questions of membership and the amalgamation of the Proceedings of the Society of American Foresters and the Forestry Quarterly. The general policy of such an amalgamation was endorsed by the meeting and the Executive Committee instructed to work out the details in cooperation with Dr. Fernow, editor-in-chief of the FORESTRY QUARTERLY. On the subject of membership the meeting expressed itself as in favor of the creation of a new class of Junior members, to be composed of professional foresters, whose achievements were not sufficient to make them eligible for active membership. This question was also referred to the Executive Committee for further consideration and for reference to letter ballot by the entire Society. Much other business was transacted, including the approval of the establishment of a section of the Society in Washington, and of the general policy of holding meetings of the Society in connection with the annual winter meeting of the American Association for the Advancement of Science, with which the Society is already affiliated.

The election of officers for the ensuing year was announced as follows: President, B. E. Fernow; Vice-President, E. H. Clapp; Secretary, Findley Burns; Treasurer, S. T. Dana; Executive Committee, W. B. Greeley (5-year term); R. C. Bryant (4-year term); Clyde Leavitt (3-year term); D. T. Mason (2-year term); F. A. Silcox (1-year term).

An open meeting of the Society was held in the afternoon of January 22, at which papers were presented by Dr. B. E. Fernow on "The Possibilities of Silviculture in America," and by Dr. Cristobal Hicken on "Vegetation Zones of Argentine and Adjoining Regions."

In the evening a well-attended smoker was held at the University Club, at which a number of informal talks were given.



The Annual Meeting

MORE members attended the annual meeting of the American Forestry Association held at the Copley-Plaza Hotel in Boston on January 17 and 18 than ever were present at any previous meeting. From every State in New England and the Southern Appalachian section, from the Atlantic States, the Northern and many of the Middle Western States they came, and spent two days hearing papers and addresses devoted to many phases of forestry, and attending a joint forestry dinner at which the guests of honor were Governor Samuel W. McCall, of Massachusetts, and Dr. Charles W. Eliot, President-Emeritus of Harvard University. It was a most successful meeting in every way, productive of a great deal of enthusiasm in the cause of forest conservation; of practical results, in action taken for the furtherance of the movement, and of publicity, which carried to the knowledge of thousands upon thousands of people the fact that the Association is a powerful national force in educating the people regarding tree and forest conditions.

President Henry S. Drinker presided at the opening session and in his address said:

"Friends of Forestry in New England who have graced our meeting with their presence: May I say on behalf of the American Forestry Association that our Directors gladly responded to the cordial invitation extended by the forest lovers of New England to the American Forestry Association to hold this, its annual meeting, in Boston? The New England States undoubtedly constitute distinctively the group of States that in the past have shown most interest in forestry, and who have done most, as a group, to forward the study and practice of sound principles of forestry looking to the proper care and reproduction of our woods, and the preservation of those of our forests which should be preserved for their scenic value. Those of us who come to you from Pennsylvania—the 'Keystone State'—from Penn's wooded State—can justly feel pride in our record of a State Forestry Association dating from 1886, an organized State Forestry Reservation Commission dating from 1893, and of pioneer efforts in the establishment of State Forest Reserves that have now grown into an estate of over one million acres of State lands set aside for the practice of forestry, exceeded in area only by the great Adirondack Reserves of the Empire State of New York, which, however, by the recent fiat of the citizens of New York in the rejection of their proposed new constitution (which would have sanctioned modern forestry practice), seem to be destined to continue to serve rather as a pleasure ground for the hunter and the fisherman and the lover of woodland life, than as a forest reserve proper.

"We congratulate you on your well-organized and active Associations for the promotion of forestry—among them prominently the Massachusetts Forestry Association, the Association for the Protection of New Hampshire Forests, the Connecticut Forestry Association and the Maine Forestry Association—in the formation of which latter the American Forestry Association was privileged to exercise a sympathetic part and interest.

"One of the greatest measures enacted by Congress in recent years, the Weeks Law for the establishment of the Appalachian Reserve, extending from New Hampshire through the Eastern States to Georgia, bears the name of your distinguished Senator and your New England foresters, led in the movement by our able and most energetic friend, Philip W. Ayres, of the New Hampshire Association, are now cooperating with the American Forestry Association and with many bodies of leading and distinguished citizens of the Atlantic States in the effort to procure the enactment of such an extension of the Weeks Law as shall enable the good work so far done in procuring and setting aside an Appalachian forest reserve to be carried on and perfected—a work full of potency and promise of good in the care, preservation, and increase of our woods and waters.

"So in coming to New England and to Boston we, foresters of the Middle, Southern and Western States, feel that we are coming to confer with old friends and good friends, whose hospitality we have before enjoyed, and whose hearty and able promotion of forestry in this section makes a visit here an inspiration and an encouragement to those of us who come to you having similar aims and sympathies.

"We thank you for your welcome and we pledge our continued and active aid in the promotion of the forest measures you have at heart for the betterment of forest interests in the New England States."

Following the annual report of the Secretary, detailing the work of the Association during 1915, reporting 2,018 new members secured, and stating the popularity of the Association's magazine, AMERICAN FORESTRY, in its new and improved form, the President appointed a nominating committee, and the members then heard the two addresses scheduled for the afternoon. These were by Philip W. Ayres, forester for the Society for the Protection of the New Hampshire Forests on "The Weeks Law Situation," and by Harold Parker, of Lancaster, Mass., Chairman of the Massachusetts State Forest Commission, who spoke on "New England's Forestry Problems." The session closed with the election of the following officers:

President—Charles Lathrop Pack, Lakewood, N. J.

Vice-Presidents—Joshua L. Baily, Pennsylvania; Andrew Carnegie, New York; William S. Colby, California, Secretary the Sierra Club; Mrs. Emmons Crocker, Massachusetts; Dr. Charles W. Eliot, Massachusetts, President Emeritus Harvard University; Dr. B. E. Fernow, Canada, Dean of Forestry, University of Toronto; Henry

S. Graves, District of Columbia, Chief of the Forest Service; Everitt G. Griggs, Washington; Hon. David Houston, Secretary of Agriculture; Hon. Franklin K. Lane, Secretary of the Interior; Hon. Asbury F. Lever, South Carolina, United States Representative; Hon. Thomas Nelson Page, Ambassador to Italy; Gifford Pinchot, Pennsylvania; Filibert Roth, Michigan, Dean of Forestry, University of Michigan; Dr. J. T. Rothrock, Pennsylvania; Mrs. William D. Sherman, Illinois, Chairman Conservation Department, National Federation of Women's Clubs, Illinois; Hon. Wm. H. Taft, Connecticut, Ex-President United States; Joseph N. Teal, Oregon, Chairman Oregon Conservation Commission; Theodore N. Vail, President American Telephone and Telegraph Company, New York; Hon. John W. Weeks, Massachusetts, United States Senator; Dr. Robert S. Woodward, Washington, D. C., President Carnegie Institution.

Treasurer, John E. Jenks, Washington, D. C., Editor, *Army and Navy Register.*

Directors for three years, John S. Ames, Massachusetts; E. T. Allen, Oregon, Forester, Western Forestry and Conservation Association; Hon. Robert P. Bass, New Hampshire, ex-Governor of New Hampshire; Herman H. Chapman, Connecticut, Professor of Forestry, Yale Forest School; Dr. Henry S. Drinker, Pennsylvania, President Lehigh University; J. E. Rhodes, Louisiana, Secretary Southern Pine Association.

THE JOINT FORESTRY DINNER

In the evening was given the joint forestry dinner under the auspices of the American Forestry Association, the Massachusetts Forestry Association, and various co-operating forestry and conservation organizations of New England. Harold Parker, chairman of the Massachusetts State Forest Commission, was the toastmaster, in the absence of Mr. Nathaniel Kidder, president of the Massachusetts Forestry Association, who was ill. The speakers were Governor Samuel W. McCall, of Massachusetts; Dr. Charles W. Eliot, President Emeritus of Harvard University; President Charles Lathrop Pack, of the American Forestry Association; William S. Whitney, president of the Emerson Paper Company, of New Hampshire; and W. B. Greeley, assistant United States Forester.

Governor Samuel W. McCall, who was received with a round of cheers, began his address by alluding facetiously to the large demands on his time as Governor, saying that he had to be in so many places that it sometimes seemed as if he were spread out very thin.

"But I say that," proceeded the Governor, "not because I do not thoroughly enjoy coming here. You are members of an organization that represents one of the great causes that are before the American people today. When I was in the House of Representatives at Washington I took great interest in this movement for conservation. This country is in very much need of conservation. As applied to material resources conservation is a good deal like conservatism in the field of the moral and intellectual forces. It is to hold on to what is good, preserve that, and go on from that and get something more by and by.

"The problem of the American people in the past twenty-five years has been to get rid of its forests. I remember that as a boy I saw any number of splendid trees cut down just to be burnt up and get the land cleared. But we have entered upon a new era. We are now developing the soil to cultivate it, and we have hardly enough soil left on which to have forests. So we are considering the problem of conserving our forests.

"I believe that our water power should be better utilized, but under conditions which would prevent it from getting into the hands of a few men and become subject to monopoly.

"Conservation with regard to forests means utilizing the forests, getting crops from them, utilizing the land to get other crops, for that is true conservation.

"I am very glad you are discussing the possibilities of Massachusetts in the way of raising forests. We have perhaps more than a million acres running to waste that might be devoted to the cultivation of forests. That problem concerns the vital prosperity and affects the total well-being of the country. The cause you represent here today is one that deeply concerns the Commonwealth of Massachusetts. It is one upon which we should have beneficial legislation, and beneath the legislation there should be a public sentiment created by bodies like this, such as will help on the cause."

THE SECOND DAY

President Charles Lathrop Pack presided at the second day's session, at which some three hundred were present. A paper by E. A. Sterling, manager of the Trade Extension Department of the National Lumber Manufacturers' Association, of Chicago, on "Forestry and Lumbering," was, in his absence, read by Secretary Percival S. Ridsdale. W. B. Greeley, assistant United States Forester, spoke on the "National Forestry Situation;" William W. Colton, Forest Commissioner of West Newton, Mass., had a paper on "City Forestry and Its Future," and H. H. Chapman, professor of forestry at the Yale Forest School, spoke earnestly on "State Forestry Organization and Problems."

At the afternoon session there were addresses by Prof. J. W. Toumey, Director of the Yale Forest School, on "Communal Forests;" by E. C. Hirst, State Forester of New Hampshire, on "State Fire Protection Work," and by Dr. H. T. Fernald, the Massachusetts State Nursery Inspector, on the "White Pine Blister Rust Menace."

These papers were followed by instructive discussions, in which a number of the members joined, the result being a most profitable presentation of ideas on the various subjects.

(NOTE.—Abstracts of papers read at the meeting will be found in this or succeeding issues of AMERICAN FORESTRY.—Editor.

Conservation at the Pan-American Scientific Congress

A MARKED feature of the Pan-American Congress held recently at Washington, D. C., was the correlation of work between departments having sympathetic features. Thus the president of the American Forestry Association was asked to deliver an address before the American Civic Association which held its annual convention in conjunction with the Congress, and in this address, after presenting the general forestry situation and the work of our association in the promotion of forestry conditions, President Drinker particularly touched on the association's advocacy of the creation of tree commissions and other civic organizations for the planting and care of trees, and on its educational campaign among the children of the country to promote interest in the growth and care of our trees and woodlands.

In the Conservation Section the addresses included several on forests and water power. Henry S. Graves, Chief Forester of the United States, in a paper on "The Forest Policy of a Nation," summed up his presentation of the subject as follows:

"A forest policy for a nation, then, as shown by the experience of the United States, would be based on the following considerations:

"1. Private ownership cannot be counted upon to conserve the forests.

"2. In its own protection a nation must take steps to prevent forest destruction.

"3. The forest land in agricultural regions should be handled as a farm crop; timberlands at the headwaters of streams should be owned or controlled by the public.

"4. Public lands should be segregated at least in a general way according to their chief use before beginning to dispose of them.

"5. The cost of correcting mistakes is always very great, as in buying back lands and in building works to check erosion.

"6. Public ownership does not retard development. It insures permanent industry. Private ownership results in temporary occupancy followed by exhaustion and depopulation.

"7. Unless there is a strong organization of public timber resources, their protection will remain largely a dead letter.

"In most of the South American countries the bulk of the forests are still in public ownership and so every opportunity is presented for a wise National Forest policy."

In an address on "Forest Problems and Economic Development in South America," Raphael Zon, Chief of Forest Investigations of the Forest Service, said: "Before the utilization of the forests of South America can be placed on a permanent basis, more knowledge is needed as to the botanical identity of the species, their life histories, and the best methods of management. This can be accomplished only by forest investigations, experiment stations, and efficient forest organizations for the protection and management at least of all public forests. The experience of the United States and of other European countries shows that such investigations, if properly conducted, are indispensable to the intelligent utilization of the timber resources of a country."

The system under which the National Forests are used for grazing was outlined by Albert F. Potter, of the United States Forest Service, in a paper on "Government Control of Grazing on the Public Lands," as follows:

"1. Limitation in the number of stock grazed and the portion of the year during which the range may be used.

"2. Division of the range between the different kinds of stock and its owners.

"3. Permits on a per capita basis instead of leases on an acreage basis.

"4. Free grazing for milch and work animals of settlers and all animals used in operations upon the forests.

"5. Charges for ranging stock at moderate rates fixed by the Government instead of at market values fixed by competitive bid.

"6. Preference to small owners and prior users.

"7. Renewal of permits to purchasers.

"8. Maximum limits to prevent monopoly.

"9. Exchange in the use of private lands.

"10. On and off permits for ranges only partially within the forests.

"11. Cooperative construction of range improvements.

"12. Recognition of advisory boards to represent users of the range in the adjustment of range matters."

Dr. Elias Leiva Quiros, of Costa Rica, recommended in his paper on forestry that all the Latin-American countries interested in the conservation of forests promulgate forest codes, and that a general director of forests be made part of the organization of the Ministry of the Interior. He called attention to the danger of granting concessions ad libitum for the exploitation of forests, and recommended that forest reserves be formed.

In conclusion, he solicited of the Congress its approval of the following declaration:

First. That governments devote the greatest attention possible to the forest problem.

Second. That those governments of Latin-America which have not already done so proceed to the formation of a forest code and to the division of the limitation of public forests.

Third. That in all the countries represented in the congress a catalogue of the forests and of the personnel of the forest services be formed.

Fourth. That the cooperation of the public powers be solicited in the establishment of an arbor day.

WATER POWER

In his paper on "The Principles Controlling the Development of Water Power on Public Lands of the United States," O. C. Merrill, of the United States Forest Service, said: "The existing law provides for the issuance of a permit or license only. This is not sufficient protection for the hundreds of millions of dollars invested upon the public lands. Such investments should be protected by long-term leases, unalterable for their term and subject to either renewal at their expiration or to purchase of properties. For protection of the public interest, no rights obtained under a lease, or properties acquired for use in connection therewith, should be capitalized for purposes of rate making or of sale to any public agency at more than cost.

"The public should never part with its title to public power sites. Lands having a prospective value for power development should be open to entry only under conditions that will reserve the power use of such lands perpetually and exclusively to the United States or its lessees."

M. O. Leighton, in discussing Coordination in "The Development of Our Water Power Resources with Other Uses of Water," said: "Coordination between the uses of water for power and for irrigation involves fewer difficulties at the present time than it has in the past, and a still more harmonious condition is promised for the future. Among the causes for this improvement are improved irrigation and power practice, increased efficiency, and adaptability of hydroelectric appliances, including the hydroelectric pump, and a greater realization upon the part of persons representing conflicting interests that, in the final analysis, the greatest benefit to any community must arise from the amicable and considerate study of these matters and the mutual adjustment of the several demands to the needs and conditions that control in each case."

Director George Otis Smith, of the Geological Survey, in his paper on "The People's Interest in Water Power Resources," said:

"The people's interest in water power is served only through use.

"The stage at which we find power development on the public-owned sites today is simply this, as described by Secretary Lane in his recent report: 'The Government was generous, but it had no intentions of being a spendthrift. When it found itself being imposed upon, the nation stayed its hand and drew back, so as to make sure of the right course. It wished use—use by as many as possible and the best use.'

"The engineering fact that stands out in the utilization of water power is the comparatively high efficiency of large systems. Lower costs of operation and better service are results that appear to follow naturally the creation of these combinations of power plants. The centralization of power development is accompanied by a large market and diversified use; and the resulting high load factor has made possible low rates, which have, in turn, encouraged the more general use of power.

"Such are the advantages to the people that are possible through hydroelectric development as a natural monopoly; it remains to make the possible advantages actual. The most notable sign of the times is the general acceptance of the principle of public control."

The Engineering Section of the Congress, presided over by General Bixby, held a joint session with the Conservation and Mining sections, at which Rome G. Brown, of Minneapolis, presented an exhaustive paper on the "Laws and Regulations Regarding the Use of Water in Pan-American Countries." He said: "The energy of the water fall is not latent. That energy is a part of the constantly acting force of gravitation. It is ever present and, unless utilized, is forever wasted. Conservation therefore, of the natural resources of a country, demands the greatest and most immediate prevention of this constantly wasting energy from undeveloped water powers and of the quickest and most extensive utilization which can possibly be made consistently with proper protection of the interests of individuals and of the public at large." . . . "The cause of this uneconomic waste"—(of our water powers) "in all countries is, that legislation for the regulation and use of water resources, instead of promoting their use, has become an obstacle to their use. Legislation has not kept pace with the progress in the science of water power development and use."

THE RESOLUTIONS

The resolutions adopted by the Conservation Section of the Congress were as follows:

"1. *Cooperation in Study of Forest Resources.*—Cooperation in the intelligent development of the forest resources of the two American continents is made necessary and desirable by their mutual dependence, each upon products of the forests of the other. Central and South America use large quantities of structural woods from the forests of North America; and North America requires the extract and dyewoods and cabinet timbers of the Central and South American forests. The nations of Pan America should therefore cooperate in determining the extent and value of their forest resources, the best means for their conservation, and the most effective utilization of their products. As the first step in this direction there should be arranged, through the Government agencies of the Pan-American countries, a cooperative study of forest conditions and forest utilization of the Pan-American Union, with the publication of data thereon.

"2. *Public Ownership of Forest Lands.*—The experience of nearly all countries has shown that the private ownership of mountainous forests, on lands unsuited to agriculture, endangers the public welfare. The burdens of private ownership during the long periods necessary to grow forest crops often lead to wasteful and uneco-

nomical utilization of the forests and failure to conserve and renew them. Aside from loss of present and future timber resources, the destruction or depletion of mountain forests vitally affects the flow of streams and other physical conditions bearing directly upon the general economic welfare. As the investigation of forest conditions progresses, therefore, it is important for the countries of the Pan-American Union to consider to what extent public ownership of their forest resources may be necessary to utilize and conserve them effectivly.

"3. *Forest Education.*—The vast extent and enormous value of the tropical forests in the countries comprising the Pan-American Union make it imperative that a school of tropical forestry for instruction in the scientific treatment and exploitation of such timberlands be established, preferably in a central or South American country.

"4. *Trade Specifications.*—To bring about better utilization of the forests of the Pan-American countries and to establish and extend their trade in forest products, it is recommended that uniform grades and specifications for such products, based upon the commercial qualities and uses of the various woods concerned, be mutually adopted."

NEW YORK STATE MEETING

THE Fourth Annual Meeting of the New York State Forestry Association was held in Syracuse, N. Y., on January 21. President James S. Whipple, former Conservation Commissioner, presided; Walter R. Stone, Mayor of Syracuse, delivered the address of welcome. President Whipple replied, and made his annual address, in which he laid especial emphasis on the need of greater numbers and of a paid secretary who would devote his entire time to the interests of the Association. The report of the common resolutions included these articles: The Association advocates a State-wide fire law; the Association endorses the work of the National Park Board; the broadening of the activities of the Association to include all phases of forest influence; the continuation of State-wide survey of forest conditions; recommendation of the Federal appropriation for $50,000 to combat the Blister Rust; the annual appropriation of specific amounts for boundary surveys in the Adirondacks and Catskill mountains; and the establishment of a State constabulary, separate from the rangers and fish and game wardens.

The following officers were elected: President, Dr. James S. Whipple; Executive Secretary, Prof. Franklin F. Moon; Treasurer, N. B. Woodworth; Vice-Presidents, Hon. Elihu Root, Hon. Morgan J. O'Brien, Mr. Frank L. Moore, Hon. Franklin D. Roosevelt, Dr. A. S. Downing, Mrs. E. G. Whitmeyer, Dr. C. M. Dow, Hon. Rush Rhees, Hon. John R. Clancy, Mr. John G. Agar, Mr. E. F. Perry, Mr. Eugene S. Bruce, Hon. E. H. Smith, Mr. K. W. Goldthwaite, Dr. George G. Atwood, Hon. George D. Pratt, Mr. Frank A. Cutting, Mr. Jacob Hassacher, Mr. F. Ambrose Clark, Mr. John B. Burnham; Executive Committee, Dr. E. H. Hall, 3 years; Dr. Hugh P. Baker, 2 years; Prof. R. S. Hosmer, 3 years; Mr. George N. Ostrander, 3 years; Mr. O. H. Van Norden, 3 years; Mr. C. R. Pettis, 2 years; Auditors, Prof. Samuel N. Spring, Mr. W. G. Howard; Trustees Permanent Fund, Hon. Charles W. Dow, Mr. Frank E. Kendall, Mr. Walter C. Witherbee.

The Association has passed the crucial period of its life and now contains 600 enthusiastic members, publishes a magazine quarterly, and by enlarging its scope will appeal to an increasing number of citizens of the Empire State who love the trees and woods.

MID-WEST FORESTRY ASSOCIATION

A NUMBER of foresters, meeting at Columbus recently, organized the Mid-West Forestry Association, the constitution of which provides that the general objects of the Association are to be propaganda to advance the cause of forestry, particularly in the Middle West, and also, as far as possible, the study of technical forestry questions in the Great Plains region.

The officers elected are: President, Prof. Frederick Dunlap, University of Missouri, Columbia, Mo.; Vice-President, Prof. Charles A. Scott, State Forester of Kansas, Manhattan, Kans.; Secretary-Treasurer, Prof. Fred. W. Smith, State Forester of North Dakota, Bottineau, N. Dak. Executive Committee: J. H. Foster, State Forester of Texas; Prof. G. B. MacDonald, Iowa State College, and Dorr Skeels, Dean of Forestry, University of Montana.

PINE BLISTER RUST ORGANIZATION

AN organization, the title of which, Interstate Committee for the Suppression of the Pine Blister Rust, explains itself, has recently been organized. It will endeavor to get Congress to appropriate $50,000 for the use of the Department of Agriculture in investigating the disease. The main committee comprises Wilfred Wheeler, of Massachusetts, chairman; F. W. Besley, Maryland; B. A. Chandler, Vermont; Robt. S. Conklin, Pennsylvania; W. T. Cox, Minnesota; Austin W. Hawes, Vermont; E. C. Hirst, New Hampshire; E. H. Jenkins, Connecticut; Frank E. Mace, Maine; Jesse B. Mowry, Rhode Island; C. R. Pettis, New York; Harris A. Reynolds, Massachusetts; Francis Windle, Pennsylvania; William P. Wharton, Massachusetts.

CANADIAN ASSOCIATION OFFICERS

THE following officers of the Canadian Forestry Association were elected at the annual meeting on January 20: President, Lieut. Col. J. B. Miller; Vice-President, Hon. Sydney Fisher; Secretary, Robson Black; Treasurer, Miss M. Robinson; Territorial Vice-Presidents, Ontario, Hon. G. H. Ferguson; Quebec, Hon. Jules Allard; New Brunswick, Hon. George J. Clarke; Nova Scotia, Hon. O. T. Daniels; Prince Edward Island, Hon. J. A. Matheson; Alberta, Hon. A. L. Sifton; British Columbia, Hon. W. R. Ross; Yukon, George Black; District of Patricia, Sir C. Cameron; Ungava, Mgr. Bruchesi, of Montreal.

Canadian Department

By Ellwood Wilson

Secretary, Canadian Society of Forest Engineers.

A discussion is at present being carried on, having been started by the Canadian Forestry Association, as to the advisability of requiring every person who enters the woods from the first of April to the first of November, whether to prospect, hunt, fish or camp, to have a permit which he would be required to show to any authorized fire-ranger. There would probably be no charge for such a permit, but it would certainly be a great help in locating the responsibility for forest fires and would make persons going into the woods much more careful as their movements would be known.

The Ontario government in building and operating their own railroad, the Temiskaming and Northern Ontario Railway, are taking great care to protect all timberlands along their right-of-way. They have in dangerous sections cleared quite a distance back from the tracks so as to form "fire zones," each train is followed by a patrolman on a speeder, and tank cars are held in readiness in case fire should break out. All engines are equipped with spark arresters and guards for the ash pans to further guard against fires. This line runs through the beautiful Temagami Forest Reserve which would be completely ruined by a large fire, a great disaster for the Province. The fire destruction in Northern Ontario in the past 25 years has been appalling and it is high time to save what is left. The example of this railroad might well be followed by the Dominion owned lines.

The Canadian Society of Forest Engineers has lost one of its most valued members by the death of Abraham Knechtel, Chief Forester, Dominion Parks Branch of the Department of the Interior. The late Mr. Knechtel was born at Brussels, Ontario, in 1859 and was in his fifty-sixth year. He was one of the pioneers in scientific forestry on this continent. He graduated from Michigan Agricultural College with the degree of Bachelor of Science and completed his forestry education at Cornell, taking the degree of Forest Engineer. For seven years he was attached to the Forest, Fish and Game Commission of New York State and then came to Ottowa to work with the Forestry Branch of the Department of the Interior. While in New York he laid out the first forest plantation made by that State. In 1904 he was sent to the St. Louis exhibition to lay out a forest nursery there for the Commission and received a special medal for his services there. He then went to Europe to study forest conditions and practice. For several years he delivered lectures on Forestry under the auspices of the New York State School Board. He was one of the charter members of the Canadian Society of Forest Engineers and a member of the Canadian Forestry Association. His work as Forester of the Dominion Parks was of a high character and he will be greatly missed.

Mr. H. R. MacMillan, Chief Forester of British Columbia, now acting as Special Trade Commissioner for that Province, has reached Johannesburg, South Africa. He writes from there that he is having a hard fight against Southern yellow pine. The orders coming to British Columbia since he began his journey tell of the success of his mission, especially those received from the British War Office. It is rumored that he will go to the front. Although South Africa has made great progress in planting to establish its own supply of timber there is still a large demand, especially for railway ties.

The Toronto City Architect has undertaken tests of Canadian woods so as to encourage their use as building materials and lessen the importation of foreign species.

Dean Adams, of the Faculty of Applied Science of McGill University, in speaking before a meeting of the Montreal Forum about the natural resources of the Dominion, called attention to the rapid decrease in our timber and the erroneous impression that it was inexhaustible. He pointed out that the forests are disappearing at a rapid rate and that better fire protection and cutting methods are necessary. He made a strong plea for better methods and more public interest in conserving our natural resources.

Thirty-five per cent of the undergraduates and graduates of the Forestry Department of the University of Toronto have enlisted for service at the front. Of sixty-two graduates twenty had enlisted up to the twentieth of October and of the seventy-one undergraduates, twenty-seven had enlisted.

On the fifteenth of December a meeting of the most prominent lumbermen and paper mill men met at the Hotel Windsor, Montreal, to discuss necessary amendments to the laws of the Province of Quebec for the protection of the forests from fire. There was very careful consideration and several amendments were suggested to the Hon. Minister of Lands and Forests and he was asked to have such amendments made law.

John H. Riegel, president of the Union Bag and Paper Company, announces that certain financial arrangements have been completed in regard to that Company's subsidiaries, The Gres Falls Company, St. Gabriel Lumber Company, and the Charlemagne and Lac Oureau Lumber Company, by which they will be consolidated into a new company to be called the St. Maurice Paper Company, and a new paper mill, a sulphite mill and a kraft paper mill will be added to the company's plant at Cap Madelaine, near Three Rivers, Quebec. These companies have extensive holdings of wood lands and have been among the staunchest friends of good fire protection.

At the government nurseries of Canada, located at Berthierville, for the Province of Quebec, at St. Williams, Ontario, for the Province of Ontario and at Indian Head, Saskatchewan, for the Dominion Government, and at another nursery being prepared at Sutherland, Saskatchewan, stock will again be available this year. The number of trees shipped from Indian Head has steadily increased from over two and one-half million in 1910 to about three and three-quarter million in 1914. These trees are distributed among farmers throughout the prairie provinces mainly for shelter belts, woodlots and the beautifying of grounds around buildings.

The fire loss in Canada for the season just finished has been about ten million dollars.

The Canadian Timber Products Association is about to send a representative to France to look into trade opportunities which will follow the war, and to offer some portable houses to the French government to help the homeless.

A bill is to be introduced in the coming session of the British Columbia Legislature authorizing the government to build thirty four-masted schooners to be fitted with auxiliary Diesel engines to be used in the lumber carrying trade.

On December 14 last, the Quebec government held an auction sale of timber lands which has been offered the previous spring but on which the upset price has not been bid.

A report made to the Forestry Branch of the Dominion government by Mr. J. A. Doucet, who examined about 8,000 square miles in Northern Alberta, shows a woeful state of affairs. Only 648 square miles retain a forest cover 100 years old or over.

This means that 92 per cent has been burned over at least once during the past century. About 8.5 per cent carrys timber from 50 to 100 years old, the average age being about 70 years, while about 14 per cent bears timber of small pole size averaging 25 years old. In some places the soil cover has been entirely burnt off and in other places the heavy slash endangers the young growth and the little remaining old forest. The damage has been about eight million dollars.

Some tests of the weight of freshly cut woods have just been made by the Laurentide Company and show that brown ash weighs 50.26 pounds per cubic foot, yellow birch 64.40 pounds, white birch 55.62 pounds, elm 71.31 pounds, and sugar maple 73.36 pounds.

British Columbia Notes.

Ever since war broke out members of the British Columbia Forest Service have been leaving on furlough for the bigger job over seas, and they are still doing so. Out of the regular or permanent staff, which in the summer of 1914, before the war, numbered about 170, including female clerks and stenographers, almost one-third have enlisted to date. In addition, over twenty members of the temporary or summer staff of guards, patrolmen, etc., are known to have enlisted, and it is very probable that as many more have joined of whom no information is now available. The recent enlistments are as follows: A. H. Black, Jack Thompson, O. J. Sangar, W. Ross Flumerfelt, E. F. W. Heath, R. Jobson, J. J. Donnelly, N. F. Murray, R. L. Condy, J. R. Chamberlin, Clarence Ferris, H. S. Laughlin, G. R. A. Ball, G. H. Llewellyn, and C. I. McKenzie.

Mr. P. Z. Caverhill, Deputy District Forester in the Vancouver Forest District, has accepted the position of chief forester for New Brunswick. Mr. Caverhill is a native of that Province, a graduate of the University of New Brunswick, and has had a wide experience and been a valued officer both in the Dominion and British Columbia forest service. His many friends will wish him every success in his new work.

Mr. J. D. Gilmour, recently District Forester at Cranbrook, has been transferred to the head office, Victoria.

Mr. H. B. Murray, formerly District Forester, Kamloops, is now in charge of the Cranbrook District, and Mr. E. B. Prowd is acting district forester for the Kamloops District.

Mr. L. R. Andrews, formerly district forester at Vernon, is now in England, a lieutenant in the Canadian Expeditionary Force. Mr. G. P. Melrose is now acting district forester for Vernon District.

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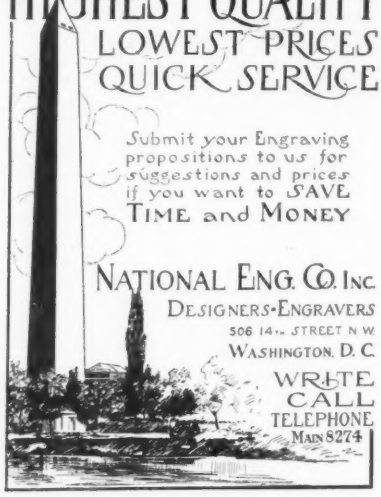

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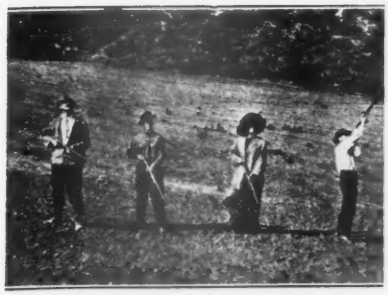

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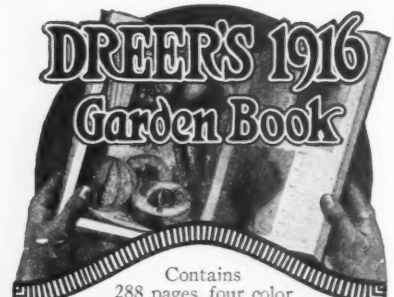

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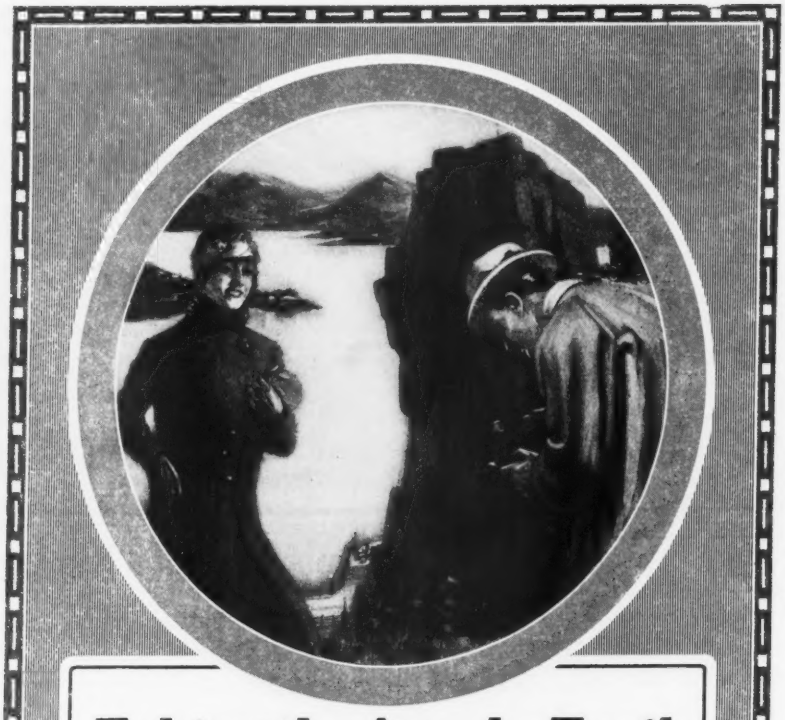

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